

Remarks

Favorable reconsideration of the above-identified application in view of the present response is respectfully requested.

Claims 1, 2, 4, 6-17 and 27-38 are pending in this application. These claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over either *Dalal* or *Siemers*. Applicants respectfully traverse this rejection.

The present invention is directed to a method of spray joining articles. At least one of the articles to be joined is a spray formed article. Because of the nature of the spray form articles, conventional metal joining techniques are not useable. This is because in most metal joining techniques that use metal, the temperature to melt the metal is so high that it causes the spray formed article to undergo a phase transformation which results in a volumetric change in the spray formed article. These volumetric changes obviously are unsuitable for the end use of the resulting part when it is desired to use the resulting part in some sort of a part forming process, that spray formed articles are typically used for.

Specifically, Applicants' invention, as recited in independent claim 1, recites a method of providing a spray formed composite article. The method comprises (a) providing a first spray formed article, (b) locating a second article adjacent the first article, (c) spraying metallic particles onto the articles, and (d) allowing the sprayed metallic particles to form a metal deposit extended between and connecting the first and second articles.

Neither *Dalal* nor *Siemers* disclose, teach or suggest the present invention.

The law is clear that a patent is to be granted unless the Patent Office can establish that the invention would have been obvious at the time it was made. The Patent Office has failed to meet this burden. The suggestion for modifying the reference, required by the law, is missing. The Patent Office has not established the requisite motivation to

modify the reference. Thus, the Patent Office has not satisfied its burden to show *prima facie* case of obviousness.

As set forth in the Office Action, neither of the *Dalal* or *Siemers* references relate to joining parts, wherein at least one of the parts to be joined is a spray formed article. The parts to be joined in these references are castings made of high strength, high temperature resistant materials such as nickle and tungsten. The spraying process used in those references create high temperatures, such as on the order of 1300°C and above, on the surfaces of the articles to be joined. The surfaces in these references are able to sufficiently withstand these types of temperatures -- the spray formed articles of the present invention are not.

Acknowledging that the references do not disclose spray joining spray formed parts, the Examiner asserts that "it would have been obvious to those of ordinary skill in the casting art that the parts can be either spray formed or conventional cast" (Emphasis added.) While the assertion is not entirely clear¹, it is clear that the Examiner offers no more than a conclusion that the invention would have been obvious. Contrary to accepted PTO practice, no explanation of why the present invention would be obvious or where in the prior art the necessary modification of the prior art is suggested has been provided. In situations like this, such a rejection cannot stand. MPEP § § 2142 and 2143.

Instead of explaining where in the prior art the necessary modification of the prior art is suggested, in the Final Office Action, the Examiner cites to *In re Durden, jr.*, as follows:

¹ As best can be understood, it appears as though the Examiner is suggesting to modify the prior art references to replace their casts articles with the spray formed articles of the present invention.

wherein the court states that a “new” process may still be obvious, even when considered “as a whole,” notwithstanding that specific starting material or resulting product, or both, is not found in prior art. Thus, the instant process is deemed to be obvious in view of the prior art process.

Office Action at page 3. (Emphasis added.)

The Examiner’s reliance upon this case is misplaced. The Examiner cites to this case for the proposition that a new process may be obvious and thus concludes that the instant process is deemed obvious in view of the prior art process. Much like the conclusory rejections stated in the first and final office actions, the Examiner concludes that the present invention must be obvious since the Federal Circuit ruled in *In re Durden, jr.*, that a new process may be obvious. The Examiner still fails to explain why the invention is obvious. As explained in *In re Dillon*, the Federal Circuit does not regard *In re Durden, jr.* as authority to reject as obvious every method claimed reading on an old type of process. *In re Dillon*, 16 USPQ 2d 1897, 1903 (Fed. Cir. 1990) (*en banc*), *cert. denied*, 500 U.S. 904 (1991).² The Federal Circuit further clarifying *Durden* goes on to state that “*Durden* did not hold that all methods involving old process steps are obvious; the court in that case concluded that the particularly claimed process was obvious; it refused to adopt an unvarying rule that the fact that non-obvious starting materials and non-obvious products are involved *ipso facto* makes the product non-obvious. Such an invariant rule always leading to the opposite conclusion is not the law.” *Id.* Accordingly, neither the *In re Durden* case the Examiner relies upon or *In re Dillon* allows the Examiner to hold that the present invention is obvious in lieu of an explanation as to why the present invention is obvious. A *prima facie* case of obviousness has not been made.

The law requires that there be some teaching, suggestion or motivation in the prior art to modify any particular reference. Specifically, the Federal Circuit requires that the motivation to modify the prior art must flow from the teachings in the art that suggest the

² Copies of all cases cited herein that were not previously provided are attached herewith for the Examiner’s convenience.

desirability or incentive to make the modification needed to arrive at the claimed invention. *See In Re Napier*, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995); *In Re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (“[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior suggest the desirability of the modification”). Hindsight cannot be used to support a modification.

It is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious.

In re Fritch, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

The CAFC has indicated that the requirements for showing motivation in the prior art is “rigorous.” *In Re Gordon*, at 1127; *In Re Anita Dembizcak and Benson Zinbarg*, 50 USPQ2d 1614 (Fed. Cir. 1999). Moreover, this showing which is rigorously required must be “clear and particular.” *Dembizcak* at 1617. *See also, C.R. Bard v. M3 Systems, Inc.*, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). It is well established that merely because references can be modified, the mere suitability for motivation does not provide motivation for the modification. *See In Re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984); *Berghauser v. Dann, Comr. Pats.*, 204 USPQ 393 (D.C. 1978); *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 USPQ at 929 (Fed. Cir. 1984). Here, the requisite motivation to modify the references in the prior art is not present.

In this particular case, the Examiner has failed to set forth any suggestion in the prior art to modify either of the *Dalal* or *Siemers* references. At best, *Dalal* and *Siemers* disclose that it may be obvious to try the present invention. However, that is not the standard under 35 U.S.C. § 103.

In Deuel. . . the court emphasizes that “obvious to try” is not the standard under 35 U.S.C. § 103. As stated in *In re Eli Lilly and Co.*, . . .

An “obvious-to-try” situation exists when a general disclosure may pique the scientist’s curiosity, such that further

investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.

Ex parte Goldgaber, 41 USPQ 2d 1172, 1177 (B.P.A.I. 1996)
(quoting *In re Eli Lilly and Co.*, 14 USPQ 2d 1741, 1743 (Fed. Cir. 1990)) (Emphasis added.)

Furthermore, it should be understood that modifying the prior art or taking teachings from the prior art and applying them to the present invention would not result in an operable process. This is because of the chemical structure of the spray formed articles that the present invention pertains to.

Spray formed articles are primarily formed of steel. The castings of the prior art are different in kind from the spray formed article recited in claim 1. Spray formed articles contain a significant level of oxides (usually on the order of about 16%), and are quite porous (usually on the order of about 13%). The cast articles in the prior art are conversely dense and have essentially no porosity. Furthermore, castings are much stronger articles than spray formed articles. For instance, typical castings have a tensile strength of about 50-200 Ksi, whereas spray formed articles typically have a tensile strength of about 2-10 Ksi. Furthermore, spray formed steel articles have a martensitic structure which undergoes phase transformation (to the austenite phase) at temperatures above about 400°C. The materials that are being sprayed in the prior art and the materials that are being sprayed onto in the prior art have melting point and phase transformation temperatures well in excess of 400°C. If the prior art processes were modified to include a spray formed article as one of the article being joined, the temperature of the resulting process would be too high for the spray formed article to withstand. As such, the resulting composite part would be unsuitable for its desired end use. Specifically, the resulting spray formed article would undergo severe dimensional instability and in particular, result in an unacceptable volume reduction. Furthermore, the joined products in the cited prior art do not require a smooth interface.

For the reasons above, one of ordinary skill in the art would not be motivated to look to the cited references for teachings on how to join spray formed articles.

Other differences exist between the present invention and the prior art references. The prior art references require preparation and post processing, i.e., preheating, specialized vacuum cleaning, heat treatment, etc. As set forth above, the prior art patents also disclose exposures to high temperatures.

For the reasons set forth above, one would not be motivated to look to the prior art patents for teaching on joined spray formed articles. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103.

Claims 2, 4, 6-17 and 27-35 all depend either directly or indirectly from claim 1 and are therefore allowable for at least the same reasons as claim 1. Moreover, these claims add further features which render them separately allowable.

For instance, claim 4 recites that each of the first and second articles have (i) upper surfaces spaced apart a first distance from each other and (ii) end surfaces that have portions that contact each other and each of the first and second articles have intermediate surfaces extending between and contacting each respective end surface with each respective upper surface. While this claim was rejected in the Office Action, there was no explanation where these limitations were found in the prior art or why these limitations are obvious. The Patent Office has failed to meet its burden for this claim. Furthermore, applicants have reviewed the prior art and have not found any disclosure or teaching of these limitations. Accordingly, claim 4 is also allowable for this reason as well.

Claim 6 recites that each of the intermediate surfaces extend at an angle of 5° to 25° relative to each respective upper surface. This is not disclosed, taught or suggested in the prior art. The Examiner apparently relies upon *Koshiga* to teach this limitation. *Koshiga* actually teaches away from the limitations recited in claim 6. *Koshiga* teaches at best 45°

angled surfaces. The 5° to 25° angled surfaces recited in claim 6 are unexpected in view of *Koshiga*.

Claim 13 further recites the step (e) of grinding the metal deposit to form a portion of a deposit that is essentially coplanar with at least the upper surface of one of the articles. While this claim was rejected in the Office Action, there was no explanation where these limitations were found in the prior art or why these limitations are obvious. The Patent Office has failed to meet its burden for this claim. Furthermore, applicants have reviewed the prior art and have not found any disclosure or teaching of these limitations. Accordingly, claim 13 is also allowable for this reason as well.

Claim 17 recites that each of the articles have an interface surface that substantially cooperates with each other. While this claim was rejected in the Office Action, there was no explanation where these limitations were found in the prior art or why these limitations are obvious. The Patent Office has failed to meet its burden for this claim. Furthermore, applicants have reviewed the prior art and have not found any disclosure or teaching of these limitations. Accordingly, claim 17 is also allowable for this reason as well.

Claim 30 recites that the sprayed metallic particles are allowed to air cool to room temperature to form the metal deposit. Nowhere in the prior art is this limitation taught, disclosed or suggested. Moreover, the Examiner fails to set forth in the Office Action where these limitations are disclosed, taught or suggested in the prior art. The Patent Office has failed to meet its burden for this claim. To the contrary, *Dalal* is indicated in the Office Action as disclosing a controlled cooling rate at column 5, last paragraph. Teaching a controlled cooling rate is not a teaching of air cooling -- but a teaching away from air cooling. Accordingly, the rejection of claim 30 should be withdrawn.

Claim 31 further recites the step (f) of smoothing the grinded metal deposit to form a composite article having an essentially seamless upper surface. While this claim was rejected in the Office Action, there was no explanation where these limitations were found in

the prior art or why these limitations are obvious. The Patent Office has failed to meet its burden for this claim. Furthermore, applicants have reviewed the prior art and have not found any disclosure or teaching of these limitations. Accordingly, claim 31 is also allowable for this reason as well.

Claim 32 recites the further step of providing at least a second metal deposit that extends between and connects the reinforcement member in at least one of the articles. This provides additional support to the article. Nowhere in the prior art is this step disclosed, taught, or suggested. While this claim was rejected in the Office Action, there was no explanation where these limitations were found in the prior art or why these limitations are obvious. The Patent Office has failed to meet its burden for this claim. Accordingly, claim 32 is also allowable for this reason as well.

Claim 28 recites that the temperature of the articles is monitored and maintained below 400°C during step (c). Claim 29 recites that the temperature of the articles is monitored and maintained between 20° and 400°C during step (e). In the Office Action, the Examiner states that *Dalal* discloses to control cooling rates for the cast articles while citing to column 5, last paragraph. While Applicants agree that *Dalal* discloses controlling the cooling rate for the cast articles, this disclosure does not teach, disclose or suggest the limitations of claims 28 and 29. Claim 28 and claim 29 are directed to controlling the temperature of the material being sprayed in step (c). They specifically recite that the temperatures must be maintained below 400°C. As set forth above, the temperature of the prior art processes are well in excess of 400°C, rendering them inoperable for the present invention. The invention as a whole must be considered. Accordingly, Applicants respectfully request withdraw of the rejections of claims 28 and 29 for these reasons as well.

Independent claim 36 recites a method of providing a spray formed part forming tool. The method comprises (a) providing a first spray formed steel article, (b) locating a second spray formed steel article adjacent the first article, (c) spraying steel particles onto the articles while monitoring and maintaining the temperature of the articles between 20°C to

400°C, (d) cooling the sprayed steel particles to room temperature to form a metal deposit extending between and connecting the first and second articles, (e) grinding the metal deposit flush relative to the articles, and (f) smoothing the deposit to form a spray formed part forming tool. None of the prior art teaches, discloses or suggests limitations of claim 36. Claim 36 is accordingly allowable.

Claims 37 through 38 depend from claim 36 and are therefore allowable for at least the same reasons as claim 36 as well as all the limitations recited therein.

Though claims 36-38 were rejected, no explanation for their rejection was set forth in the Office Action.


These claims are directed to connecting steel spray formed articles. As set forth above, the prior art does not teach connecting spray formed articles, let alone steel spray formed articles. As also set forth above at page 6, the difference between the high temperature cast articles in the prior art and the spray formed steel articles directed in claims 36-38 are such that one of ordinary skill in the art would not expect their teachings to apply to the present invention, nor is their sufficient teaching in the prior art of how to obtain the desired result of the present invention. *Ex parte Goldgaber*. At best, the prior art makes the invention "obvious to try" — not obvious. *Id.* Given the differences in materials in the prior art and the present invention, there could be no reasonable expectation of success for the proposed modification. MPEP § 2143.02. The high temperatures of the prior art would destroy the steel spray formed articles of the present invention. Claims 36-38 are allowable.

The present response was not earlier presented because the Applicants believed that the prior amendment had placed the application in a condition for allowance. The present response does not raise any new issues and does not require any further searching on the part of the Examiner. Entry is therefore solicited.

Applicant submits that the claims are in a condition for allowance and respectfully request a notice to that effect. If the Examiner believes that discussion or a claim amendments of a minor nature would advance the prosecution of the application, the Examiner is highly encouraged to telephone the Applicants' attorney at the number given below.

The Commissioner is hereby authorized to charge or credit any deficiencies associated with the filing of this Paper to the Deposit Account of Applicants' assignee, Ford Global Technologies LLC, Deposit Account No. 06-1510. A duplicate copy of the Amendment Transmittal is enclosed for this purpose.

Respectfully submitted,
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Court of Appeals, Federal Circuit

In re Fritch

No. 91-1318

Decided August 11, 1992

JUDICIAL PRACTICE AND PROCEDURE

1. Procedure — Judicial review — Standard of review — Patents (§410.4607.09)

Obviousness determination is based on underlying factual inquiries concerning claimed invention and prior art, which are reviewed for clear error on appeal, but ultimate conclusion of obviousness is reviewed as matter of law.

PATENTS

2. Patent construction — Claims — Broad or narrow (§125.1303)

Prior art patent for grass edging and watering device cannot be held to teach that device is flexible and conformable to ground in its entirety, since base portion of device includes prominent anchoring leg which would inhibit longitudinal flexibility, and since patent's express teaching that trench is necessary to install device in harder ground shows that it is not freely conformable thereto.

3. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Patentability/Validity — Obviousness — Combining references (§115.0905)

Claims for landscape edging device are not prima facie obvious in view of combined teachings of two prior patents, since primary reference does not suggest overall flexibility and landscape retention function of claimed device, and since secondary reference does not, merely by virtue, of flexibility of device described therein, suggest extensive modifications which would bring primary reference into conformity with application claims.

4. Patentability/Validity — Obviousness — Combining references (§115.0905)

Mere fact that prior art may be modified to reflect features of claimed invention does not make modification, and hence claimed invention, obvious unless desirability of such modification is suggested by prior art; claimed invention cannot be used as instance of "template" to piece together teachings of prior art so that claimed invention is rendered obvious.

Appeal from the U.S. Patent and Trademark Office. Board of Patent Appeals and Interferences.
Patent application of John R. Fritch (serial no. 06/838,721, landscape apparatus and method). From decision upholding rejection of application claims 1-7, 9-24, 29 and 30, applicant appeals. Reversed.

Charles L. Gholz, of Obion, Spivak, McClelland, Maier & Neustadt, Arlington, Va. (John R. Fritch, Corpus Christi, Texas, on brief), for appellant.

Jameson Lee, associate solicitor (Fred E. McKelvey, solicitor, with him on brief; Richard E. Schafer, of counsel), for appellee.

Before Smith, senior circuit judge, and Plager and Rader, circuit judges.

Smith, J.

John R. Fritch (Fritch) appeals the 27 February 1991 decision of the Patent and Trademark Office Board of Patent Appeals and Interferences (Board) affirming-in-part and the Examiner's final rejection of the remaining claims in Fritch's application entitled Landscape Edging Apparatus and Method.¹ The Examiner concluded that Fritch's invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. § 103. The Board, except for allowing claim 28, agreed. The Board's decision is reversed.

Issue

The issue is whether the Board erred in affirming the Examiner's determination that the prior art references of Wilson and Hendrix rendered the subject matter of Fritch's independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art.

Background

In his final rejection, the Examiner rejected claims 1-24 and 27-30 of Fritch's application as unpatentable for obviousness under 35 U.S.C. § 103. Fritch appealed the final rejection to the Board. The Board affirmed the rejection as to claims 1-24, 29 and 30, entered a new ground of rejection for claim 27, and reversed as to claim 28. The Board agreed with the Examiner that the teachings of the Wilson and Hendrix patents rendered

the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art. Fritch does not appeal the Board's disposition as to claims 27 and 28, and at oral argument withdrew the appeal as to claim 8. The claims remaining in this appeal are 1-7, 9-24, 29 and 30.

The Fritch Invention

The invention claimed by Fritch involves a landscape edging device which includes a planar base portion and an upwardly extending retainer portion. The base portion is elongate, thin, flexible and has a planar bottom surface conformable to a varying slope ground surface. One longitudinal edge of the base portion serves as a mowing strip and the other serves as a retaining flange for landscape fill. The upwardly extending retainer portion is integrally connected (e.g., fused) to the base portion and defines a longitudinally extending enclosed space. The Fritch invention is intended to be used as a retainer for landscape fill in order to separate unmowable landscape fill from the mowable lawn. It may also be used to secure a landscaping sheet to the ground, or to function as guards at the base of a fence. Independent claims 1 and 13 on appeal are representative of the subject matter claimed:

1. A landscape edging strip formed in its entirety of a thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion integral with said base portion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion adjacent one longitudinal edge of said base portion to define a mowing strip adjacent the other longitudinal edge of said base portion.

13. A landscape edging strip formed in its entirety from thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion

integral with said base portion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion at a transverse location between the longitudinal edges of said base portion, thereby defining a longitudinally extending retaining flange on one side of said retainer portion and a mowing strip on the other side of said retainer portion.

The critical language in Fritch's independent claims is that the device is to be, in its entirety, both flexible and "conformable to a ground surface of varying slope." These limitations, although located in the claims' preambles, "are necessary to give meaning to the claim[s] and properly define the invention." Figure 1 from Fritch's drawings is reproduced below:

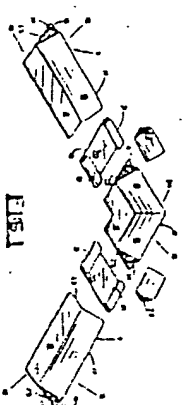


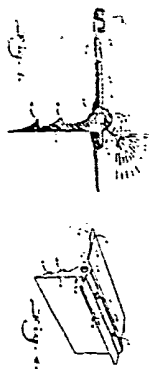
FIG. 1

The Prior Art
a. The Wilson Patent

The Wilson patent relied upon by the Examiner and the Board is entitled "Grass Edging and Watering Device." The embodiment of the Wilson device includes a substantially flat mowing strip extending horizontally from a longitudinally extending body portion. Opposite the mowing strip is a scored flange which may be broken off when not needed or wanted. Between the mowing strip and the flange, and extending vertically from the body portion is an anchoring leg. Located above the anchoring leg is the body portion which contains a water conduit and sprinkler head assembly. The device is intended to be used adjacent to the borders of walks and plant beds. Figures 1 and 4 from Wilson's drawings are reproduced below:

¹ *Parkin Elmer Corp. v. Computerwision Corp.*, 732 F.2d 888, 896, 221 USPQ 669, 675 (Fed. Cir. 1984).

² U.S. Patent No. 3,483,449.



b. The Hendrix Patent

The Hendrix patent is entitled "Loose Material Retainer Strip". The Solicitor chose not to discuss the Hendrix reference in his brief, stating that the Board had deemed Hendrix unnecessary to its decision. The Solicitor overstates the Board's position. The Board based its decision upon "a collective evaluation of the Wilson and Hendrix patents". We include Hendrix in our discussion because it did play a role in the rejection of Fritch's independent claims.

The Hendrix device is composed of elongated, flexible strips having substantially C-shaped cross-section. The bottom lip of the device is to be wider than the top lip in order to facilitate fastening the device to the ground. The device will fit most gentle contours, and the top lip will yield laterally to build-up of gravel until the gravel can be redistributed. The concave portion of the strip is installed such that it faces the material to be retained in place. Hendrix contemplates that the retainer will be used in retaining gravel in driveways, lining flower beds, or on the shoulders of asphalt or concrete highways. Figure 1 of Hendrix's drawings is reproduced below:

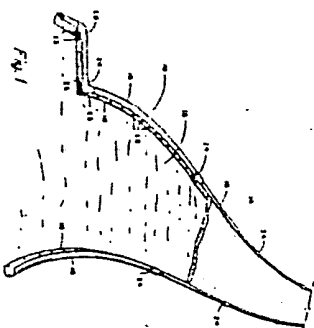


Fig. 1

U.S. Patent No. 4,349,596.

Standard of Review

[1] "[O]bviousness is a question of law to be determined from the facts." The obviousness determination "is based upon underlying factual inquiries concerning the claimed invention and the prior art" which are reviewed for clear error. However, it is the ultimate conclusion of obviousness which the Federal Circuit reviews as a matter of law.

Teachings of Wilson

Fritch takes exception to the Examiner's findings of fact related to the teachings of the Wilson patent. The Examiner's rejection and the Board's opinion rely heavily on the use of Wilson in view of other references to declare the Fritch invention obvious. The Board states that it agrees with the Examiner's finding of fact regarding the teachings of Wilson. In the Examiner's answer, which the Board quotes, the Wilson device is described as follows:

Wilson discloses a landscaping edging strip comprising a relatively thin gauge, elongated flexible base portion including a mower strip B having a planar bottom surface conformable to a varying slope surface.

The Board states that the Wilson reference presents "substantial evidence that Wilson is both thin and flexible." The Board regards the Wilson device as teaching that it is flexible and conformable in its entirety. This finding demonstrates clear error.

[2] It is well settled that a prior art reference is relevant for all that it teaches to those of ordinary skill in the art. The base portion of Wilson is not planar in its entirety, as the Board's opinion suggests, but also includes a prominent anchoring leg to secure the device to the ground. The anchoring leg, which runs the length of the Wilson device, would inhibit longitudinal flexibility of the Wilson device. Indeed, Wilson expressly contemplates flexibility and conformability *only* in the mower strip. Wilson states that its mower strip may be lifted in order to pick dirt thereunder for the purpose of securing the device to the ground. Fritch, on the other hand, is claimed to be flexible in its entirety.

¹ *In re De Blauwe*, 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

² *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1057 (Fed. Cir. 1990).

³ *In re De Blauwe*, 736 F.2d at 703, 222 USPQ at 195.

⁴ *Beckman Instruments Inc. v. LKB Producter AB*, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989).

The Board's holding that Wilson is flexible in its entirety is based upon a misapprehension of the scope of Wilson's teachings.

Second, Wilson's anchoring leg prohibits conformability to the ground surface in the manner claimed by Fritch. The Examiner's description of Wilson as having a "planar bottom surface conformable to a varying slope surface" is applicable *only* in reference to the mower strip. This description, however, ignores the anchor leg and the fact that it must be placed *into* the ground. Wilson expressly teaches that the anchoring leg may be pushed into soft soils, but in harder terrain a trench is needed in order to place the Wilson sprinkler system. In order to install the Wilson apparatus, the ground surface must be altered to conform to the device rather than, as the Solicitor contends, that Wilson is freely conformable to the ground. Fritch, on the other hand, does not require such extensive alteration of the ground surface in order to install the device.

Prima Facie Obviousness

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. "[T]he Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." The patent applicant may then attack the Examiner's prima facie determination as improper made out, or the applicant may present objective evidence tending to support a conclusion of nonobviousness.

Fritch has attacked the Board's finding that the Examiner established that Fritch's claimed invention was prima facie obvious in view of the teachings of the prior art. The Board states that "a collective evaluation of the Wilson and the Hendrix patents would have rendered the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill." Fritch maintains that there is no teaching, suggestion, or incentive in the prior art to modify or to combine the

teachings of the prior art in the manner suggested by the Examiner. We agree.

[3] Wilson teaches a grass edging and watering device which includes an anchoring leg for securing the device to the ground. Wilson contemplates that a trench will need to be dug in order to allow the anchoring leg to be placed into the ground if the condition of the soil requires it. This anchoring leg prohibits flexibility and conformability over the length of Wilson. Any flexibility or conformability in Wilson, which the Board states extends to the entire device, is limited to the mower strip. It is only the mower strip that is mentioned as being flexible in order to aid installation. Hendrix has been cited for its teaching of a flexible retainer strip that is able to conform to the ground surface.

Wilson addresses the problems of arresting growth of grass between areas and watering plants without wetting sidewalks. Wilson lacks any suggestion or incentive to use its water conduit as a landscape retainer since this would arguably result in clogged sprinkler heads. Wilson also teaches that its mower strip is flexible in order to allow dirt to be picked thereunder. There is no suggestion in Wilson to extend that flexibility to the entire device. Wilson also lacks any teaching or suggestion that one should remove the anchoring leg. Hendrix does not, simply by virtue of its flexible nature, suggest these extensive changes which the Board states are obvious. Neither Wilson nor Hendrix, alone or in combination, provide any incentive to combine the teachings of the prior art in the manner maintained by the Board.

[4] "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so." Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested

⁵ *In re Ptaschke*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

⁶ *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) (citing *In re Loh*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

⁷ *In re Heldt*, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970).

⁸ This court has previously found a proposed modification inappropriate for an obviousness inquiry when the modification rendered the prior art reference inoperable for its intended purpose. *In re Gordon*, 753 F.2d 960, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

⁹ *ACS Hosp. Systems, Inc. v. Montclair Hosp.*, 733 F.2d 1572, 1577, 221 USPQ 920, 913 (Fed. Cir. 1984).

Released June 25, 1992

TRADEMARKS AND UNFAIR TRADE PRACTICES

1. Acquisition, assignment, and maintenance of marks — Acquisition through use — Priority of use (§305.0503)

Practice and procedure in Patent and Trademark Office — Interpartes proceedings — Opposition and cancellation — In general (§325.0305.01)

Infringement; conflicts between marks — Likelihood of confusion — In general (§335.0301)

The decision of the Board affirming the Examiner's rejection of independent claims 1, 13, 24, and 29 of Fritch's application as unpatentable over the prior art under 35 U.S.C. § 103 is reversed. Since dependent claims are nonobvious if the independent claims from which they depend are nonobvious, the Board's affirmation of the rejection of dependent claims 2-7, 9-12, 14-23, and 30 is also reversed."

REVERSED

U.S. Patent and Trademark Office
Trademark Trial and Appeal Board

CBS Inc. v. Mercandante

Nos. 85,324 and 85,330

Decided June 15, 1992

"*In re Gordon*, 733 F.2d at 902, 221 USPQ at 1127.

"*In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). See also *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

"*In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1600.

"*In re Fine*, 837 F.2d at 1076, 5 USPQ2d at 1600 (citing *Fluorine Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1109, 1108, 2 USPQ2d 1836, 1831 (Fed. Cir. 1987)). See also *In re Stricker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983) (when argued together, dependent claims stand or fall with the independent claims from which they depend).

911 RESCUE BAR¹ and 911 RESCUE BAR and design² for candy bars.

CBS Inc. opposed the registration of applicants' marks on the ground of priority of use and likelihood of confusion. Opposer claims use of the mark RESCUE: 911 as a service mark for a television program series since prior to May 31, 1990. Opposer has made the following allegations:

7. As a result of the tremendous popularity of Opposer's television program series "RESCUE: 911," Opposer has entered into several licensing arrangements and has licensed the use of its mark "RESCUE: 911" for various merchandise items, such as mugs, caps, T-shirts, sweatshirts, watches and toys.

8. Upon information and belief, Applicant has made no use in the United States of the mark "911 RESCUE BAR" prior to May 31, 1990.

9. Upon information and belief, the goods for which Applicant seeks to register its mark — candy bars — are related to those in connection with which Opposer has used its "RESCUE: 911" mark.

10. The dominant portion of Applicant's mark contains a word and number identical to the word and number comprising Opposer's mark but in reverse order, and so resembles Opposer's "RESCUE: 911" mark, as to be likely when applied to the goods of the Applicant, to cause confusion, or to cause mistake or to deceive. As Applicant has disclaimed the exclusive right to use "BAR," it is evident that "911 RESCUE" is the dominant portion of the Applicant's mark.

11. As a result of Applicant's use of the mark "911 RESCUE BAR," the public is likely to be confused and deceived into the mistaken belief that goods offered and advertised by Applicant have their origin with Opposer, and that such goods are approved, endorsed, or sponsored, by, or associated in some way with, Opposer. This confusion is likely since Opposer is already using its mark "RESCUE: 911" on various merchandise items, as noted in Paragraph 7 above. Applicant's use of the

mark "911 RESCUE BAR" on candy bars would lead the public into the mistaken belief that these candy bars are another merchandise item on which Opposer is using its mark.

12. Opposer would be injured by granting Applicant a certificate of registration for its mark because it is so similar to Opposer's "RESCUE: 911" mark that, when applied to the goods of Applicant, it would be likely to cause confusion, to cause mistake or to deceive and would suggest falsely a connection with Opposer. Opposer further would be injured by the granting of such registration, because it inevitably would damage Opposer's valuable rights in its "RESCUE: 911" mark.

In their answer, applicants admitted paragraph Nos. 9 and 10 of the opposition, denied paragraph No. 11, asserting that in view of applicants' superior rights in their marks, "[i]t is Opposer's use (rather than Applicant's use) of the mark" which will confuse and deceive the public; denied paragraph No. 12, asserting that in view of applicants' superior rights in their marks, applicant (not opposer) will be injured; and denied the remaining allegations.

Applicants filed a counterclaim to cancel opposer's pleaded registration on the grounds of priority of use and likelihood of confusion. Applicants allege use of the marks 911 RESCUE BAR since at least as early as October 22, 1985³, and 911 RESCUE TEAM on t-shirts since at least as early as December 4, 1985.

Opposer denied the salient allegations in applicants' counterclaim to cancel opposer's pleaded registration and pleaded the affirmative defenses of laches, acquiescence and estoppel. Opposer also pleaded that applicants have abandoned use of their marks 911 RESCUE BAR and 911 RESCUE TEAM and that because there are no grounds to support the allegations in the counterclaim, applicants filed the counterclaim in violation of Fed. R. Civ. P. 11.

On April 1, 1992, applicants filed a motion under Fed. R. Civ. P. 12(c) requesting that paragraph No. 17 of applicants' coun-

¹ Applicants' counterclaim does not state the goods on which applicants have used, since October 22, 1985, the mark 911 RESCUE BAR; presumably, applicants claim use of 911 RESCUE BAR on candy bars.

David S. Fishman, Windsor, Conn., for applicants.

Marshall J. Nelson, Washington, D.C., for opposer.

Before Sams, Rice, and Quinn, members.

By the board.

James V. Mercandante and Rose Marie Mercandante filed applications to register

Consolidated trademark oppositions no. 85,324 and 85,330, by CBS Inc. against James V. Mercandante and Rose Marie Mercandante d/b/a 911 Rescue Bar, applications serial no. 74/076,762, filed July 9, 1990, and 74/081,873, filed July 23, 1990, in which applicants counterclaim to cancel opposer's pleaded registration. On opposer's motion to amend its answer to counterclaim, and on applicant's motions to strike opposer's affirmative defenses, and for judgment on the pleadings. Motion for judgment on pleadings granted in part.

Dr. Alfred Hackmack has petitioned the Commissioner to restore the original filing date for the above-identified application which was cancelled for failure to comply with the filing requirements of 37 C.F.R. §2.21.

Petitioner filed the subject application pursuant to Section 44(d) of the Act on December 4, 1989. In a letter dated January 8, 1990, the Supervisor of the Trademark Application Section notified petitioner that the filing date would be cancelled because the application failed to include: (1) a statement of bona fide intention to use the mark in commerce, and a claim of the benefit of a prior foreign application; and (2) a statement, on the drawing page, concerning priority filing information under Section 44(d) of the Trademark Act. The application papers were returned and the filing fee was scheduled for refund. This petition followed.

Petitioner has resubmitted the original application papers. A review of the application reveals that the required statement that the "applicant has a bona fide intention to use the mark in commerce," and a claim of the benefit of a prior foreign application are included in the application. The original drawing page, however, does not contain the foreign priority information.

Trademark Rule 2.146(a)(3) permits the Commissioner to invoke supervisory authority in appropriate circumstances such as this. With respect to the alleged omission of the statement of bona fide intention to use the mark in commerce and the claim of priority, the Trademark Applications Supervisor clearly erred by refusing to grant the original filing date on this basis, because the application contained the required statements.

The second issue is whether it was appropriate to refuse the application a filing date because the heading did not contain the priority filing information. Trademark Rule 2.21 concerning the requirements for receiving a filing date requires:

(3) A drawing of the mark sought to be registered substantially meeting all the requirements of section 2.52.

Trademark Rule 2.52(d) requires the drawing to contain a heading which includes, *inter alia*, "the priority filing date of the relevant foreign application in an application claiming the benefit of a prior foreign application in accordance with section 44(d) of the Act."

[1] Office policy concerning the requirement that the heading of the drawing page include the filing date of the foreign application in a U.S. application claiming priority under Section 44(d) of the Trademark Act has been relaxed, as discussed in a recent memorandum from the Office of the Director of Trademark Operation:

In the case of the drawing heading, the applicant should only be denied a filing date if the applicant omits the heading entirely. The applicant should be granted a filing date if individual elements of the [heading] are missing, such as the filing date of the foreign application in a U.S. application claiming priority under Trademark Act Section 44(d). This is a change in policy.

There is no valid reason to exclude this application from the benefit of this change in policy.

The petition is granted. The trademark Applications Supervisor is directed to grant petitioner its original filing date of December 4, 1989.¹ The petition fee is waived and will be refunded because the petition was necessitated by Office error.

¹ Petitioner has refiled an application for the same mark for the identical goods, based only on Section 1(b) of the Act, (because the six month period in which to file pursuant to Section 44(d) of the Act had expired). These papers will be consolidated with that file. The Examining Attorney is directed to examine the application papers which include both a Section 1(b) and 44(d) claim.

Court of Appeals, Federal Circuit

In re Dillon

No. 88-1245

Decided November 9, 1990

PATENTS

1. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Patent and Trademark Office properly found that applicant's claims for hydrocarbon fuel containing tetra-orthoesters that reduce particulate emissions upon combustion are prima facie obvious over prior patents for hydrocarbon fuels containing tri-orthoesters for purpose of "dewatering" fuels and preventing phase separation of fuels and alcohol, and in view of secondary references using tri- and tetra-orthoesters as water scavengers in non-hydrocarbon hydraulic fluids, even though no reference discloses use of applicant claims are not limited to soot reduction use and are not physically or structurally distinguishable from those of prior art patents except as to orthoester component, and since PTO has shown sufficiently close relationship between tri- and tetra-orthoesters in fuel oil art to create expectation that hydrocarbon fuels containing tetra-esters would have properties sufficiently similar to those of fuels containing tri-esters to provide motivation to make tetra-ester fuel compositions.

2. Patentability/Validity — Obviousness — Relevant prior art — In general (§115.0903.01)

Prima facie case for obviousness of chemical composition is established if there is structural similarity between claimed and prior art subject matter, proved by combining references or otherwise, and if prior art gives reason or motivation to make claimed composition; burden and opportunity then falls on applicant to rebut prima facie case through showing that claimed composition possesses unexpectedly improved properties or properties lacking in prior art, that prior art is so deficient that there is no motivation to make changes that otherwise appear obvious, or by any other pertinent argument or presentation of evidence.

3. Patentability/Validity — Obviousness — Relevant prior art — In general (§115.0903.01)

Patentability/Validity — Obviousness — References and claims as whole (§115.0904)

All evidence of properties of claimed chemical composition and prior art must be considered in determining ultimate question of obviousness, but discovery that claimed composition possesses property not disclosed for prior art does not alone defeat prima facie case, and it is not necessary, in order to establish prima facie case, to show both structural similarity between claimed and prior art compound and suggestion in, or expectation from, prior art that claimed compound will have same or similar utility as one newly discovered by applicant; to extent that *In re Wright*, 6 USPQ2d 1959, conflicts with such holding, it is overruled.

4. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Claims for hydrocarbon fuel containing tetra-orthoesters were properly rejected as obvious over prior art patents for fuels containing tri-orthoesters, even though references do not relate to problem of reducing particulate emissions which was addressed by applicant, since application claims are not limited to that use and merely recite compositions analogous to those in prior patents, and since applicant has made no showing to overcome prima facie presumption of similar properties for these analogous compositions; mention, in applicant's method claims, that amount of orthoester must be sufficient to reduce particulate emissions is not distinguishing limitation of such claims, since specified amount is not different from prior art or critical to use of claimed composition.

5. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Patent describing use of tri- and tetra-orthoesters as water scavengers in hydraulic fluid is not outside field of prior art relevant to determining obviousness of applicant's claims for hydrocarbon fuel composition containing tetra-orthoesters for purpose of reducing particulate emissions, since person concerned with fuel oils is chargeable with knowledge of prior patents disclosing use of tri-orthoesters in fuel for dewatering purposes and therefore also chargeable with knowledge of references to tri-orthoesters as dewatering agents in other fluids, and since statement in prior patent of equivalency be-

tween tri- and tetra-orthoesters is not challenged.

6. Patentability/Validity — Obviousness — References and claims as whole (§115.0904)

Board of Patent Appeals and Interferences, in upholding rejection of applicant's claims for hydrocarbon fuel composition containing tetra-orthoesters for reduction of particulate emissions as obvious over patents for hydrocarbon fuels containing tri-orthoesters for purposes of water scavenging and prevention of phase separation between fuels and alcohol, did not fail to consider unexpected results produced by invention or fail to consider claimed invention as whole, since presumption of obviousness created by showing that prior art compositions suggested claimed compositions was not overcome through showing that such compositions possessed properties not possessed by prior art, that prior art compositions and use were so lacking in significance that there was no motivation for others to make obvious variations, or that claimed compositions are more important than prior art, and since board therefore properly concluded that applicant had not shown unexpected results for claimed compositions.

7. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Patentability/Validity — Obviousness — Evidence of (§115.0906)

Examiner's reference, in rejecting as obvious applicant's claims for fuel compositions containing tetra-orthoesters for purpose of reducing particulate emissions, to data in application showing that prior art hydrocarbon fuel compositions containing tri-orthoesters demonstrated similar emissions-reducing activity, did not violate rule that claims should not be rejected solely on applicant's own showing of equivalency, since references to comparative data in patent application were not employed as evidence of equivalence between tri- and tetra-orthoesters, but were made merely to show that applicant could not demonstrate superiority of claimed tetra-orthoester compositions.

8. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Claims for hydrocarbon fuel compositions containing tetra-orthoesters to reduce particulate emissions were properly rejected for obviousness, since claims in question differ from other properly rejected claims only by

limiting amounts of alcohol and added ortho-ester in fuel to less than 1 percent and no more than 5 or 9 volume percent respectively, since no objective evidence was presented to establish different or unexpected result from limiting amount of alcohol in such manner, since primary references relied on for obviousness finding also contain less than 1 percent alcohol, since limits on amount of orthoester do not result in amount of ester different from that used for "dewatering" fuels in primary references, and since ortho-ester limitations have not been shown to be critical.

9. Practice and procedure in Patent and Trademark Office — Board of Patent Appeals and Interferences — Rules and rules practice (§110.1105)

Patentability/Validity — Obviousness — In general (§115.0901)

Decision of Board of Patent Appeals and Interferences upholding obviousness rejection of applicant's method claims for hydrocarbon fuel composition is affirmed, since board properly rejected applicant's composition claims and applicant did not argue separate patentability of method claims to board.

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Diane M. Dillon, no. 06/671,570, entitled "Hydrocarbon Fuel Composition." From decision of Board of Patent Appeals and Interferences upholding rejection of claims 2-14, 16-22, and 24-37, applicant appealed, and rejection was reversed in panel decision with Archer, J., dissenting (13 USPQ2d 1337). Patent and Trademark Office then petitioned for rehearing and suggested rehearing in banc. Rehearing in banc was ordered, judgment of panel was vacated, and accompanying opinion was withdrawn. On rehearing in banc, rejection of all claims is affirmed, with Archer, Markley, and Michel, circuit judges, joining in part; Cowen, senior circuit judge, and Newman and Meyer, circuit judges, dissent in separate opinion.

James H. Laughlin, Jr., of Benoit, Smith & Laughlin, Arlington, Va. (Gregory F. Wirzibicki, of Unocal Corp., Brea, Calif., with him on brief), for appellant.

Fred E. McKelvey, solicitor (Richard E. Schaffer, associate solicitor and Joseph F. Nakamura, with him on brief), for appellee.

William S. Thompson, Arlington, Va. (Donald R. Dunner, Herbert H. Miniz, and Thomas L. Irving, of Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C., with him on brief; Harold C. Wegner, of Wegner & Bretschneider, Washington, of counsel), for amicus curiae American Intellectual Property Law Association.

Allen S. Meiser and Linda J. Shapiro, of Mason, Fenwick & Lawrence, Washington, D.C., for amicus curiae Chemical Manufacturers Association.

Irving Kayton, Washington, D.C. for amicus curiae Professor Irving Kayton.

Robert A. Chittum, Rochester, N.Y., for amicus curiae Rochester Patent Law Association.

Before Nies, chief judge, Cowen, senior circuit judge, and Rich, Markley, Newman, Archer, Mayer, Michel, Plager, Lourie, Cleveenger, and Rader, circuit judges.

Lourie, J.

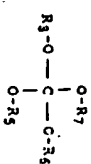
Diane M. Dillon, assignor to Union Oil Company of California, appeals the November 25, 1987, decision of the Board of Patent Appeals and Interferences (Board) of the United States Patent and Trademark Office (PTO), Appeal No. 87-0944, rejecting claims 2-14, 16-22, and 24-37, all the remaining claims of patent application Serial No. 671,570 entitled "Hydrocarbon Fuel Composition." We affirm the rejection of all of the claims.

The Invention

Dillon's patent application describes and claims her discovery that the inclusion of certain tetra-orthoester compounds in hydrocarbon fuel compositions will reduce the emission of solid particulates (i.e., soot) during combustion of the fuel. In this appeal Dillon asserts the patentability of claims to hydrocarbon fuel compositions containing these tetra-orthoesters, and to the method of

reducing particulate emissions during combustion by combining these esters with the fuel before combustion.

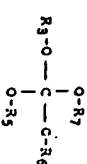
Claim 2 is the broadest composition claim: 2. A composition comprising: a hydrocarbon fuel; and a sufficient amount of at least one orthoester so as to reduce the particulate emissions from the combustion of the hydrocarbon fuel, wherein the orthoester is of the formula:



wherein R₃, R₅, and R₇ are the same or different monovalent organic radicals comprising to about 20 carbon atoms.

The broadest method claim is claim 24:

24. A method of reducing the particulate emissions from the combustion of a hydrocarbon fuel comprising combusting a mixture of the hydrocarbon fuel and a sufficient amount of at least one orthoester so as to reduce the particulate emissions, wherein the orthoester is of the formula:



wherein R₃, R₅, and R₇ are the same or different monovalent organic radicals comprising 1 to about 20 carbon atoms.

The other claims contain additional limitations and thus are narrower in scope.

The tetra-orthoesters are a known class of chemical compounds. It is undisputed that their combination with hydrocarbon fuel, for any purpose, is not shown in the prior art, and that their use to reduce particulate emissions from combustion of hydrocarbon fuel is not shown or suggested in the prior art.

The Rejection

The Board held all of the claims to be unpatentable on the ground of obviousness, 35 U.S.C. §103, in view of certain primary and secondary references. As primary references the Board relied on two Sweeney U.S. patents, 4,390,417 ('417) and 4,395,267 ('267). Sweeney '417 describes hydrocarbon fuel compositions containing specified chemical compounds, viz., ketals, acetals,

¹ A panel of this court heard this appeal and reversed the Board on December 29, 1989. 892 F.2d 1554, 13 USPQ2d 1337. The PTO petitioned for rehearing and suggested rehearing in banc on February 12, 1990. Rehearing in banc was ordered on May 21, 1990, and the judgment which was entered on December 29, 1989, was vacated, the accompanying opinion being withdrawn.

and tri-orthoesters,¹ used for "dewatering" the fuels, particularly diesel oil. Sweeney '267 describes three-component compositions of hydrocarbon fuels heavier than gasoline, immiscible alcohols, and tri-orthoesters, wherein the tri-orthoesters serve as cosolvents to prevent phase separation between fuel and alcohol. The Board explicitly found that the Sweeney patents do not teach the use of the tetra-orthoesters recited in appellant's claims.

The Board cited Elliott U.S. Patent 3,903,006 and certain other patents, including Howk U.S. Patent 2,840,613, as secondary references. Elliott describes tri-orthoesters and tetra-orthoesters for use as water scavengers in hydraulic (non-hydrocarbon) fluids. The Board stated that the Elliott reference shows equivalence between tri-orthoesters and tri-orthoesters, and that "it is clear from the combined teachings of these references... that [Dillon's tetra-orthoesters] would operate to remove water from non-aqueous liquids by the same mechanism as the orthoesters of Sweeney."

The Board stated that there was a "reasonable expectation" that the tri- and tetra-orthoester fuel compositions would have similar properties, based on "close structural and chemical similarity" between the tri- and tetra-orthoesters and the fact that both the prior art and Dillon use these compounds as "fuel additives." The Commissioner argues on appeal that the claimed compositions and method "would have been *prima facie* obvious from combined teachings of the references." On this reasoning, the Board held that unless Dillon showed some unexpected advantage or superiority of her claimed tetra-orthoester fuel compositions as compared with tri-orthoester fuel compositions, Dillon's new compositions as well as her claimed method of reducing particulate emissions are unpatentable for obviousness. It found that no such showing was made.

The Issue

The issue before this court is whether the Board erred in rejecting as obvious under 35 U.S.C. §103 claims to Dillon's new compositions and to the new method of reducing

¹ Tri-orthoesters have three -OR groups bonded to a central carbon atom, and the fourth carbon bond is to hydrogen or a hydrocarbon group (R); they are represented as C(R)(OR). Tetra-orthoesters have four -OR groups bonded to a central carbon atom, and are represented as C(OR). See Dillon's claims, *supra*.

particulate emissions, when the additives in the new compositions are structurally similar to additives in known compositions, having a different use, but the new method of reducing particulate emissions is neither taught nor suggested by the prior art.

The Broad Composition Claims

Claim 2, the broadest composition claim, comprises a hydrocarbon fuel and an amount of tetra-orthoester sufficient to reduce the particulate emissions from the combustion of the hydrocarbon fuel. The other composition claims contain various limitations including a minimum amount of emission reduction to be achieved (claim 3), percentages of ester in the fuel (claims 4, 5, 16, 20, 21), use of different esters (claims 6-10, 17-19), use of different fuels (claims 11-14, 22), and the requirement that the composition be essentially free of alcohol (claims 36, 37).

The Board stated in its opinion that, to the extent that appellant had not chosen to separately argue the patentability of the appealed claims, "they stand or fall together," citing *In re Kaslow*, 707 F.2d 1366, 1376, 201 USPQ 67, 70 (CCPA 1979). We agree with the Board except as noted briefly below. It is not the practice of this court to review claims that an applicant has not separately argued at the Board level, because, *inter alia*, we lack the benefit of the Board's reasoned decision on the separate patentability of those claims. *Id.* at 1376, 201 USPQ at 70. *In re Herbert*, 461 F.2d 1390, 1391, 174 USPQ 239, 260 (CCPA 1972). We will therefore review only the merits of the composition claims, as did the Board.

[1] The Board found that the claims to compositions of a hydrocarbon fuel and a tetra-orthoester were *prima facie* obvious over Sweeney '417 and '267 in view of Elliott and Howk. We agree. Appellant argues that none of these references discloses or suggests the new use which she has discovered. That is, of course, true, but the composition claims are not limited to this new use, *i.e.*, they are not physically or structurally distinguishable over the prior art compositions except with respect to the orthoester component. We believe that the PTO has established, through its combination of references, that there is a sufficiently close relationship between the tri-orthoesters and tetra-orthoesters (see the cited Elliott and Howk references) in the fuel oil art to create an expectation that hydrocarbon fuel composi-

tions containing the tetra-esters would have similar properties, including water scavenging, to like compositions containing the tri-esters, and to provide the motivation to make such new compositions. Howk teaches use of both tri- and tetra-orthoesters in a similar type of chemical reaction. Elliott teaches their equivalence for a particular practical use.

Our case law well establishes that such a fact situation gives rise to a *prima facie* case of obviousness. See *In re Sherry*, 566 F.2d 81, 85, 195 USPQ 753, 755-56 (CCPA 1977); *In re Albrecht*, 514 F.2d 1385, 1388, 185 USPQ 590, 593 (CCPA 1975); *In re Murch*, 464 F.2d 1051, 1054, 175 USPQ 89, 91 (CCPA 1972); *In re Hoch*, 428 F.2d 1341, 1343, 166 USPQ 406, 409 (CCPA 1970).

Appellant cites *In re Wright*, 848 F.2d 1216, 1219, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988), for the proposition that a *prima facie* case of obviousness requires that the prior art suggest the claimed compositions' properties and the problem the applicant attempts to solve. The earlier panel opinion in this case, *In re Dillon*, 892 F.2d 1554, 13 USPQ2d 1337 (now withdrawn), in fact stated "a *prima facie* case of obviousness is not deemed made unless both (1) the new compound or composition is structurally similar to the reference compound or composition and (2) there is some suggestion or expectation in the prior art that the new compound or composition will have the same or a similar utility as that discovered by the applicant." *Id.* at 1560, 13 USPQ2d at 1341 (emphasis added).

[2,3] This court, in reconsidering this case *in banc*, reaffirms that structural similarity between claimed and prior art subject matter, proved by combining references or otherwise, where the prior art gives reason or motivation to make the claimed compositions, creates a *prima facie* case of obviousness, and that the burden (and opportunity) then falls on an applicant to rebut that *prima facie* case. Such rebuttal or argument can consist of a comparison of test data showing that the claimed compositions possess unexpectedly improved properties or properties that the prior art does not have (*In re Albrecht*, 514 F.2d 1389, 1396, 185 USPQ 585, 590 (CCPA 1975); *Murch*, 464 F.2d at 1056, 175 USPQ at 92), that the prior art is so deficient that there is no motivation to make what might otherwise appear to be obvious changes (*Albrecht*, 514 F.2d at

1396, 185 USPQ at 590; *In re Sterniski*, 444 F.2d 581, 170 USPQ 343 (CCPA 1971); *In re Ruschig*, 343 F.2d 965, 145 USPQ 274 (CCPA 1965)), or any other argument or presentation of evidence that is pertinent. There is no question that all evidence of the properties of the claimed compositions and the prior art must be considered in determining the ultimate question of patentability, but it is also clear that the discovery that a claimed composition possesses a property not disclosed for the prior art subject matter, does not by itself defeat a *prima facie* case. *Sherry*, 566 F.2d at 86, 195 USPQ at 756. Each situation must be considered on its own facts, but it is not necessary in order to establish a *prima facie* case of obviousness that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion in or expectation from the prior art that the claimed compound or composition will have the same or a similar utility as one newly discovered by applicant. To the extent that *Wright* suggests or holds to the contrary, it is hereby overruled. In particular, the statement that a *prima facie* obviousness rejection is not supported if no reference shows or suggests the newly-discovered properties and results of a claimed structure is not the law.¹

Under the facts we have here, as described above, we have concluded that a *prima facie* case has been established. The art provided the motivation to make the claimed compositions in the expectation that they would have similar properties. Appellant had the opportunity to rebut the *prima facie* case. She did not present any showing of data to the effect that her compositions had properties not possessed by the prior art compositions or that they possessed them to an unexpectedly greater degree. She attempted to refute the significance of the teachings of the prior art references. She did not succeed and we do

¹ The earlier, now-withdrawn Dillon opinion, this opinion, and the dissent cite and rely on cases involving claims to chemical compounds, whereas this case involves compositions. The reason for this reliance is that, in this case, the principal difference between the claimed and prior art compositions is the difference between chemical compounds, *viz.*, tri-orthoesters and tetra-orthoesters. Cases dealing with chemical compounds are therefore directly analogous here and, in view of the history of this case and its *in banc* status, we will make much comment on these cases in this opinion. We do not, however, intend to imply that in all cases involving claimed compositions, structural obviousness between involved chemical compounds necessarily makes the claimed compositions *prima facie* obvious.

not believe the PTO was in error in its decision.

[4] Appellant points out that none of the references relates to the problem she confronted, citing *In re Wright*, and that the combination of references is based on hindsight. It is clear, however, that appellant's claims have to be considered as she has drafted them, i.e., as compositions consisting of a fuel and a tri-orthoester, and that Sweeney '417 and '267 describe the combination of a liquid fuel with a related compound, a tri-orthoester. While Sweeney does not suggest appellant's use, her composition claims are not limited to that use; the claims merely recite compositions analogous to those in the Sweeney patents, and appellant has made no showing overcoming the *prima facie* presumption of similar properties for those analogous compositions. The mention in the appealed claims that the amount of orthoester must be sufficient to reduce particulate emissions is not a distinguishing limitation of the claims, unless that amount is different from the prior art and critical to the use of the claimed composition. See *In re Reni*, 419 F.2d 922, 925, 164 USPQ 245, 247 (CCPA 1970). That is not the case here. The amount of ester recited in Sweeney '417 approximately equimolar to the amounts of water in the fuel which the ester is intended to remove (01-5%).

[5] Appellant attacks the Elliott patent as non-analogous art, being in the field of hydraulic fluids rather than fuel combustion. We agree with the PTO that the field of relevant prior art need not be drawn so narrowly. As this court stated in *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986) (quoting *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979)):

[T]he determination that a reference is from a non-analogous art is therefore two-fold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to

the particular problem with which the inventor was involved.

Following that test, one concerned with the field of fuel oils clearly is chargeable with knowledge of Sweeney '417, which discloses fuel compositions with tri-orthoesters for detawenting purposes, and chargeable with knowledge of other references to tri-orthoesters, including for use as detawenting agents for fluids, albeit other fluids. These references are "within the field of the inventor's endeavor." Moreover, the statement of equivalency between tri- and tetra-orthoesters in Elliott is not challenged. We therefore conclude that Elliott is not excludable from consideration as non-analogous art. It is evidence that supports the Board's holding that the prior art makes the claimed compositions obvious, a conclusion that appellant did not overcome.

[6] Appellant urges that the Board erred in not considering the unexpected results produced by her invention and in not considering the claimed invention as a whole. The Board found, on the other hand, that no showing was made of unexpected results for the claimed compositions compared with the compositions of Sweeney. We agree. Clearly, in determining patentability the Board was obligated to consider all the evidence of the properties of the claimed invention as a whole, compared with those of the prior art. However, after the PTO made a showing that the prior art compositions suggested the claimed compositions, the burden was on the applicant to overcome the presumption of obviousness that was created, and that was not done. For example, she produced no evidence that her compositions possessed properties not possessed by the prior art compositions. Nor did she show that the prior art compositions and use were so lacking in significance that there was no motivation for others to make obvious variants. There was no attempt to argue the relative importance of the claimed compositions compared with the prior art. See *In re May*, 574 F.2d 1082, 1092-95, 197 USPQ 601, 609-11 (CCPA 1978).

[7] Appellant's patent application in fact included data showing that the prior art compositions containing tri-orthoesters had equivalent activity in reducing particulate emissions (she apparently was once claiming such compositions with either tri-orthoesters or tetra-orthoesters). She asserts that the examiner used her own showing of equivalence against her in violation of the rule of *In re Ruff*, 256 F.2d 590, 596, 118 USPQ 340, 346 (CCPA 1958). While we caution against such a practice, it is clear to us that references by the PTO to the comparative

data in the patent application were not employed as evidence of equivalence between the tri- and tetra-orthoesters; the PTO was simply pointing out that the applicant did not or apparently could not make a showing of superiority for the claimed tetra-ester compositions over the prior art tri-ester compositions.

Other Claims

[8] As indicated above, the Board held that it would not consider the appealed claims separately, since appellant did not. Nonetheless, appellant, in her brief before the Board, did refer generally to claims directed to fuels essentially free of alcohol (Brief at 32, J. App. at 122), and the Board, in its decision, did respond, stating that no objective evidence was presented to establish any different or unexpected results from limiting the amount of alcohol to less than 1%. *In re Dillon*, No. 87-0944, slip op. at 9-10 (Bd. Pat. App. & Int. Nov. 25, 1987). We agree. Moreover, Sweeney '417 describes compositions which also contain less than 1% alcohol, so there is no real distinction in the claims over the prior art.

Appellant also argued in her brief to the Board that she "must contest" the examiner's position concerning claims limited to no more than 5 or 9 volume percent added orthoester, mentioning claims 16-21 and 27-31. The Board did not expressly deal with these claims, but it is clear to us that, since these limits do not result in an amount of ester different from that disclosed to remove water in Sweeney '417, and no criticality is shown for these limitations, the subject matter of these claims has not been shown to have been nonobvious.

Regarding the method claims, the Commissioner urges affirmance, citing *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), for the proposition that even "substitution of an unobvious starting material into an old process does not necessarily result in an unobvious process." The PTO has, as the Commissioner urges here, applied *Durden* regularly to claims to processes of making and processes of using, on the ground that the type of step involved in the claimed process is not novel.¹

We make no judgment as to the patentability of claims that Dillon might have made and properly argued to a method directed to the novel aspects of her invention, except to question the lack of logic in a claim

to a method of reducing particulate emissions by combusting. Suffice it to say that we do not regard *Durden* as authority to reject as obvious every method claim reading on an old type of process, such as mixing, reacting, reducing, etc. The materials used in a claimed process as well as the result obtained therefrom, must be considered along with the specific nature of the process, and the fact that new or old, obvious or nonobvious, materials are used or result from the process are only factors to be considered, rather than conclusive indicators of the obviousness or nonobviousness of a claimed process. When any applicant properly presents and argues suitable method claims, they should be examined in light of all these relevant factors, free from any presumed controlling effect of *Durden*. *Durden* did not hold that all methods involving old process steps are obvious; the court in that case concluded that the particularly claimed process was obvious; it refused to adopt an unvarying rule that the fact that nonobvious starting materials and nonobvious products are involved *ipso facto* makes the process nonobvious. Such an invariant rule always leading to the opposite conclusion is also not the law. Thus, we reject the Commissioner's argument that we affirm the rejection of the method claims under the precedent of *Durden*.

[9] However, appellant did not argue in her brief the separate patentability of her method claims. The statement in her brief to the Board that "the invention 'as a whole' includes the property of the claimed compositions — which property is taken advantage of in the method claims" (Brief at 22, J. App. at 112) is not such a separate argument, since it implies more an added argument for the patentability of the composition claims than an argument that, even if the claimed compositions are found to have been obvious, the claimed methods were nonobvious for particularly stated reasons. Moreover, no such reasons were particularly stated by Dillon. We will therefore not analyze these claims separately and affirm the Board's rejection on that basis.

The Dissent

The strong assertions by the dissent and its treatment of some of the case law impel us to make the following comments:

The dissent argues that our decision is "contrary to the weight and direction of . . . precedent, as embodied in over three decades of decision." That we are resurrecting the "Hass-Henze" doctrine, which was "discarded thirty years ago", and that our holding today "changes what must be proved in

¹ The dissent misinterprets this comment as indicating that claims to new compounds and compositions must contain a limitation to a specific use, and states that past cases have rejected this proposition. Our comment only points out that the composition claims on appeal are not structurally or physically distinguishable from the prior art compositions by virtue of the recitation of their newly-discovered use.

² See M.A. Litman, *Obvious Process Rejections Under 35 USC 103*, 71 JPLOS 775 (1989); H.C. Wegner, *Much Ado About Durden*, 71 JPLOS 785 (1989).

order to patent a new chemical compound and composition and its new use, and thus changes what is patentable." We have done none of the above.

What we have done is to decide the case before us on the basis of long-established principles which had provided a stable understanding of the chemical patent law until the issuance of the original panel opinion in this case which we have now vacated. Our intent is to restore the law to its state existing before that panel opinion.

The length of the dissent and the number of cases it discusses may convey the impression that the weight of past jurisprudence is contrary to our holding today. That is not the case. The cited cases are simply not controlling on the facts of the present case or they are not contrary. Many do not deal with the requirements of a *prima facie* case. Some involve process claims, not compound or composition claims. Others are not pertinent for other reasons.

In brief, the cases establish that if an examiner considers that he has found prior art close enough to the claimed invention to give one skilled in the relevant chemical art the motivation to make close relatives (isomers, analogs, isomers, etc.) of the prior art compound(s), then there arises what has been called a presumption of obviousness or a *prima facie* case of obviousness. *In re Henze*, 181 F.2d 196, 85 USPQ 261, (CCPA 1950); *In re Hass*, 141 F.2d 122, 127, 130, 60 USPQ 544, 548, 552 (CCPA 1944). The burden then shifts to the applicant, who then can present arguments and/or data to show that what appears to be obvious, is not in fact that. When the invention is looked at as a whole, *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963). The cases of *Hass* and *Henze* established the rule that, unless an applicant showed that the prior art compound lacked the property or advantage asserted for the claimed compound, the presumption of unpatentability was not overcome.

Exactly what facts constituted a *prima facie* case varied from case to case, but it was not the law that, where an applicant asserted that an invention possessed properties not known to be possessed by the prior art, no *prima facie* case was established unless the reference also showed the novel activity. There are cases cited in the dissent, in which a *prima facie* case was not established based on lack of structural similarity. See *In re Grabiatk*, 769 F.2d 729, 732, 226 USPQ 870, 872 (Fed. Cir. 1985); *In re Taborsky*, 502 F.2d 773, 780-81, 183 USPQ 50, 55 (CCPA 1974). Some of the cited cases also contained language suggesting that the fact that the

claimed and the prior art compounds possessed the same activity were added factors in the establishment of the *prima facie* case. E.g., *In re Zedler*, 682 F.2d 961, 966, 215 USPQ 490, 494 (CCPA 1982); *In re Grunwell*, 609 F.2d 486, 491, 203 USPQ 1035, 1058 (CCPA 1979); *In re Payne*, 606 F.2d 303, 314, 203 USPQ 245, 255 (CCPA 1979); *In re Swan Wood*, 582 F.2d 638, 641, 199 USPQ 137, 139 (CCPA 1978); *In re Lamberit*, 545 F.2d 747, 751, 192 USPQ 278, 281 (CCPA 1976); *In re Suvi*, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971). Those cases did not say, however, as the dissent asserts, that, in the absence of the similarity of activities, there would have been no *prima facie* case.

For example, the dissent quotes a statement in *Grabiatk* that "[w]hen chemical compounds have very close structural similarities and similar utilities, without more a *prima facie* case may be made." 769 F.2d at 731, 226 USPQ at 871. That case does not state, as implied by the dissent, that without the similarity of utilities, there would not have been a *prima facie* case. A conclusion based on one set of facts does not necessarily rule out a similar conclusion with slightly different facts.

One case cited by the dissent as "rejecting the PTO's interpretation of *Henze* as establishing a legal presumption of obviousness" was *In re Mills*, 281 F.2d 218, 126 USPQ 513 (CCPA 1960). All that case decided, however, was that a one-carbon member of a homologous series is too far from the prior art disclosure of 8 to 12 members to justify the presumption. *Id.* at 223-24, 126 USPQ at 517-18.

We will not review all the cases cited in the dissent, but *Stemnick* is an important case, for it overruled *Henze* and *In re Riden*, 318 F.2d 761, 138 USPQ 112 (CCPA 1963) (a case similar to *Henze*), "to the extent that [they] are inconsistent with the views expressed herein." 444 F.2d at 587, 170 USPQ at 348. The views that were expressed therein were that:

[w]here the prior art reference neither discloses nor suggests a utility for certain described compounds, why should it be said that a reference makes obvious to one of ordinary skill in the art an isomer, homologue or analog or related structure, when that mythical, but intensely practical person knows of no "practical" reason to make the reference compounds, much less any structurally related compounds? *Id.* at 586, 170 USPQ at 347. Thus, *Stemnick*, rather than destroying the established practice of rejecting closely-related compounds as *prima facie* obvious, qualified it

by holding that a presumption is not created when the reference compound is so lacking in any utility that there is no motivation to make close relatives.

Albrecht followed this line of thinking when it held that the prior art compound so irritated the skin that it could not be regarded as useful and therefore did not create a motivation to make related compounds. 514 F.2d at 1392, 1395-96, 185 USPQ at 587, 590.

Properties, therefore, are relevant to the creation of a *prima facie* case in the sense of affecting the motivation of a researcher to make compounds closely related to or suggested by a prior art compound, but it is not required, as stated in the dissent, that the prior art disclose or suggest the properties newly-discovered by an applicant in order for there to be a *prima facie* case of obviousness.

The dissent cites the seminal case of *Papesch*, suggesting that it rejected the principle that we now "adopt," thereby implying that we are weakening *Papesch*. We are doing nothing of the sort. *Papesch* indeed stated that a compound and all of its properties are inseparable and must be considered in the determination of obviousness. We heartily agree and intend not to retreat from *Papesch* one inch. *Papesch*, however, did not deal with the requirements for establishing a *prima facie* case, but whether the examiner had to consider the properties of an invention at all, when there was a presumption of obviousness. 315 F.2d at 391, 137 USPQ at 51. The reference disclosed a lower homolog of the claimed compounds, so it was clear that implicitly a *prima facie* case existed; the question was whether, under those circumstances, the biological data were admissible at all. The court ruled that they were, *id.* at 391, 137 USPQ at 51, and we agree with that result. The dissent quotes the brief passage at the end of the *Papesch* opinion to the effect that the prior art must "at least to a degree" disclose the applicant's desired property, *id.* at 392, 137 USPQ at 52, but this brief mention was not central to the decision in that case and did not refer to the requirements of a *prima facie* case. *Papesch* is irrelevant to the question of the requirements for a *prima facie* case, which is the question we have here.

The dissent refers to a number of cases, including *In re Lunsford*, 357 F.2d 380, 148 USPQ 716 (CCPA 1966), stating that the court had rejected the Patent Office's position of "structures only." That case must be understood in the context of the refusal of the examiner to consider any showing of improved properties, not in the context of a discussion whether a *prima facie* case was

created. The compounds were conceded to be sufficiently close to the prior art that, without a showing of a significant difference in properties, they would have been obvious. *Id.* at 381, 148 USPQ at 717.

The dissent asserts that the *Sherry* case "diverg[ed] from the weight of [the court's] precedent" in holding that a *prima facie* case was made based on similarities of structure. The court, in that opinion, accepted the *prima facie* case and concluded that "applicant ha[d] offered no evidence of obviousness, as by showing an actual difference in properties." 566 F.2d at 86, 195 USPQ at 756 (citing *Hoch*). The opinion does not suggest that the court was diverging from the weight of precedent.

The dissent mentions positions advanced by the Commissioner, including citing the *In re Mod*, 408 F.2d 1035, 161 USPQ 281 (CCPA 1969) and *In re de Montmollin*, 344 F.2d 976, 145 USPQ 416 (CCPA 1965) decisions. We do not, however, in today's decision necessarily adopt any positions of the Commissioner other than those stated in our opinion and note that neither *Mod* nor *de Montmollin* dealt with the requirements of a *prima facie* case. They concerned the question whether the existence of a new property for claimed compounds in addition to a property common to both the claimed and related prior art compounds rendered the claimed compounds unobvious. We are not faced with that question today.

Other cases, e.g., *In re Gyurik*, 596 F.2d 1012, 1018, 201 USPQ 552, 557-58 (CCPA 1979) ("[i]n common-properties presumption rises from the mere occurrence of a claimed compound at an intermediate point in a conventional reaction yielding a specifically named prior art compound"), have qualified the original rule of the *Hass-Henze* cases, but it is clear that they have not enunciated a rule that, in order to make a *prima facie* case of obviousness, the examiner must show that the prior art suggests a new property discovered by applicant. In not accepting that principle today, as urged in the dissent, we are therefore not retreating from the recent trend of case law development or changing the law.

Another example of the lack of direct pertinence of a case quoted in the dissent is *May*, which the dissent cites as an example of the consistent line of decisions to the effect that "both structure and properties must be suggested in the prior art before a *prima facie* case of obviousness was deemed made." This case does not state that both structure and properties "must" be suggested. The claimed and prior art compositions were both disclosed as having analogous activity; it was

conceded that a *prima facie* case was made out, but the court concluded that applicants had rebutted the presumed expectation that structurally similar compounds have similar properties with a showing of an actual unexpected difference of properties between the claimed compound and the prior art. 574 F.2d at 1095, 197 USPQ at 611. The applicant in that case thus made a showing that Dillon did not make in this case.

Properties must be considered in the overall evaluation of obviousness, and the lack of any disclosure of useful properties for a prior art compound may indicate a lack of motivation to make related compounds, thereby precluding a *prima facie* case, but it is not correct that similarity of structure and a suggestion of the activity of an applicant's compounds in the prior art are necessary before a *prima facie* case is established.

Conclusion

We affirm the Board's decision rejecting claims 2-14, 16-22, and 24-37.

AFFIRMED

Archer, J., with whom Markey and Michel, JJ., join, concurring in part.

I join the majority opinion except to note that the comments on *In re Durdan*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), are unnecessary to the decision of this case. The method claims were not rejected by the Board on the basis of that case and, in fact, were not separately considered by the Board. Until a rejection of a method claim based on *Durdan* is appealed to this court and the issue fully briefed, it is premature to consider the scope and effect of *Durdan*. Accordingly, I do not join this part of the majority opinion.

Newman, J., with whom Cowen and Mayer, JJ., join, dissenting.

The court today resolves certain disparities in the extensive body of precedent on the question of obviousness of new chemical compounds and compositions. However, these disparities are resolved in a way that is contrary to the weight and direction of this precedent, as embodied in over three decades of decision. The court departs from its considered development of the law governing patentability of new chemical compounds and compositions, and reinstates a rule of "structural obviousness". In so ruling the court not only rejects the weight of precedent, but also errs in the application of 35 U.S.C. §§101, 102, and 103.

quired the inventor to go beyond the general teachings in the prior art, and prove that the prior art compound did not, in fact, possess the specific property and advantage of the new compound or composition. Such proofs were invariably required when the prior art suggested the general property and use disclosed by the applicant. Many dozens of decisions of the CCPA and this court illustrate this procedure, and the variety of factual circumstances in which it has been invoked.

In accordance with the court's *in banc* holding,² a new chemical compound or composition is not patentable even when the prior art does not suggest that the new chemical compound or composition would have the applicant's newly discovered property and use, unless the applicant makes the same showing that is required when the prior art does suggest the applicant's new property and use.

"Unexpected" properties and results, *whether or not* the prior art provides an expectation or suggestion of the properties and re-

² The majority holds that a *prima facie* case of obviousness is made whenever the structure of the applicant's new compound or composition (or mechanical device) is "obvious" from that shown in the prior art, independent of whether the prior art suggests or makes obvious the applicant's newly discovered property and use. The majority allows an exception for situations where the prior art gives no "reason" or motivation to make the claimed invention, and duly makes clear that this means motivation to make the new compound or composition for the prior art use, not for the applicant's newly discovered use. This exception comes into play only when the prior art structure has no known utility, and a few such situations are reported, e.g., *In re Sternbach*, 444 F.2d 581, 170 USPQ 343 (CCPA 1971) (prior art compounds used only as intermediates), and *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975) (no practical utility). Thus, according to the majority, when the prior art chemical compound or composition has no known use, the prior art provides no "reason or motivation" to make a structurally similar new compound or composition, and in such case the prior art would not make a *prima facie* case of obviousness based on structural similarity alone.

While I welcome any reduction in the sweep of the court's holding, this exception is of trivial impact. In most cases the prior art compound or composition has some known use, and thus for most cases the majority's "motivation" test would be met based solely on similarity of structure. This is an important change of law. While the holdings of the prior law were not entirely consistent — see the various CCPA opinions discussed *post* — this *in banc* court now establishes the rule that will control all cases in the future.

sults disclosed in the patent application. And unless the applicant proves that the prior art structure does not actually possess the same unobvious property that the applicant discovered for the new structure, the court holds today that the new chemical compound or composition is not patentable. This is an incorrect application of the patent statute, and a rejection of the wisdom of precedent. Therefore, respectfully, I dissent.

THE LAW

A

The In Banc Issue

Diane M. Dillon appeals the decision of the PTO Board of Patent Appeals and Interferences, which had rejected all of Dillon's claims on the basis that "The claimed subject matter would have been *prima facie* obvious from the combined teachings of the references." The Commissioner, asking the court to choose between divergent decisions of the CCPA, stated the PTO position that *prima facie* obviousness should be based on chemical structure alone:

[I]f the prior art suggests an inventor's compound or composition per se, that compound or composition would be *prima facie* obvious, regardless of the properties disclosed in the inventor's application. Commissioner's brief at 24.

The majority of the *in banc* court adopts the Commissioner's position, expressly rejecting the panel's position that the properties and use discovered by the applicant must be considered in connection with determination of the *prima facie* case under section 103, thereby overruling all prior decisions that so held.³

I would hold that determination of whether a *prima facie* case of obviousness has been made requires consideration of the similarities and differences as to structure and properties and utility, between the applicant's new compounds or compositions and those shown in the prior art. *The Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) factors can not be ignored in determination of the *prima facie* case under 35

³ It is the role of the *in banc* court to resolve "a precedent-setting question of exceptional importance." Fed. Cir. R. 35(a), and not simply to second-guess the panel on the facts of a particular case.

¹ The court allows one exception, as I shall discuss.

U.S.C. §103.³ As illustrated in precedent, pertinent considerations in determination of whether a *prima facie* case is made include the closeness of the prior art subject matter to the field of the invention, the motivation or suggestion in the prior art to combine the reference teachings, the problem that the inventor was trying to solve, the nature of the inventor's improvement as compared with the prior art, and a variety of other criteria as may arise in a particular case; all with respect to the invention as a whole, and decided from the viewpoint of a person of ordinary skill in the field of the invention.

Of course not all these aspects will loom large in every case, but when present they must be considered. They are as pertinent to determination of the *prima facie* case as they are to the determination that is made after rebuttal evidence is adduced by the applicant. Structure alone, without consideration of the applicant's newly discovered properties, is an incomplete focus for consideration of these factors.

B

The Prima Facie Case

The *prima facie* case, as used in patent examination, means not only that the evidence of the prior art reasonably allows the examiner's conclusion of unpatentability, but also that the prior art compels such a conclusion as a matter of law, if the applicant produces no evidence to rebut it. *Black's Law Dictionary*, 1071 (5th Ed. 1979); *In re Plasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). See the discussion in *In re Mills*, 281 F.2d 218, 222 & n.2, 126 USPQ 513, 516 & n.2 (CCPA 1960), of the "presumption of unpatentability" based on prior art, a judicial usage before the term "*prima facie* case" appeared in CCPA and board decisions.

Patentability is determined, in the first instance, by examination of the patent application in the PTO. The prior art is searched by the patent examiner, who determines whether a *prima facie* case of unpatentability is made based on what was known in the prior art. *Plasecki*, *supra*. The *prima facie* rejection may be challenged by the applicant on grounds such as that the rejection is

insufficiently supported, or, incorrect, or based on illogical reasoning; or, if a *prima facie* case is made, evidence may be adduced in rebuttal. *In re Held*, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970). The *prima facie* case is not "set in concrete", and upon the submission of rebuttal evidence the determination of obviousness *vel non* is made on the entire record. *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The initial determination by the patent examiner is critical to further proceedings, for the presence or absence of a *prima facie* case of obviousness controls the need for the applicant to adduce rebuttal evidence of unobviousness. The procedure serves to clearly allocate the burdens of going forward and of persuasion as between the examiner and the applicant. *In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984). It determines what the applicant must prove, and the kind of evidence the applicant must provide. Thus it determines what is patentable under the statute.

While many judicial decisions turn on the question of adequacy of the rebuttal evidence, the concern of the *in banc* court today is the issue of the *prima facie* case. For when, as here, no rebuttal evidence is presented, determination of the *prima facie* case is decision of the question of patentability.

As illustrated in Dillon's case, the question of whether there is a *prima facie* case of obviousness controls whether Dillon is required to prove that her newly discovered property of particulate (soot) reduction during combustion is not actually possessed by the prior art composition, when the prior art composition was not known or suggested to have this property. Dillon did not so prove, and the Commissioner urges that since Dillon's specification itself discloses that the prior art composition does possess this newly discovered property, the *prima facie* case based on structural similarity was not rebutted.

Henceforth, the courts generally recognized a controlling distinction between the two principal types of factual situations that arise when a patent applicant's new chemical compound or composition has a structure that is "similar" to chemical structures shown in the prior art: (1) those where the prior art suggests, at least in general terms, that the new chemical compound or composition will have the applicant's newly discovered property and use; and (2) those where it does not. These factual situations have had different consequences with respect to whether a *prima facie* case of obviousness was made. The difference turned on whether

or not the structure and properties and use of a new chemical compound or composition were suggested in the prior art. The distinction determined whether the applicant was required to come forward with rebuttal evidence, which often was in the form of new technological information not known to the prior art, in order to establish an "unexpected" difference between the properties discovered by the applicant and those actually possessed by the prior art structure.

This distinction brought a consistent application of the law of 35 U.S.C. §103 to the examination of chemical inventions, for it established the framework wherein the law was applied to the facts of each case. The court today rejects this distinction, holding *in banc* that it suffices to show *prima facie* obviousness whenever the prior art describes a similar chemical structure, provided only that the prior art gives some "reason or motivation" to make the claimed chemical structure, "regardless of the properties disclosed in the inventor's application", in the Commissioner's words. This position is contrary to the weight and direction of precedent, as I shall illustrate, and is contrary to the statutory imperatives of Title 35.⁴

C
Precedent

It is critical to an effective patent system that there be consistent law, consistently applied, despite the great diversity of technologies that the patent system must serve. The law that is applied in determining whether a *prima facie* case of obviousness is made, as to new chemical compounds and compositions and their uses, has evolved from analysis of many different factual situations. The large number of decisions on this issue, of the court and the CCPA, produced a rich body of precedent.

The following outline of precedent is chronological, and has its roots in cases decided before enactment of the 1952 Patent Act.

For a while, during an earlier period of modern chemistry, "structural obviousness"

alone was deemed to create a presumption of unpatentability. Leading decisions were *In re Hass*, 141 F.2d 122, 127, 130, 60 USPQ 544, 548, 552 (CCPA 1944) and *In re Henze*, 181 F.2d 196, 85 USPQ 261 (CCPA 1950). In these decisions the CCPA held that there was a presumption of obviousness based solely on the close similarity of structure of chemical homologs,⁵ regardless of the new property and use that the applicant discovered. Thus a new compound, if a homolog of a known compound, was not patentable unless the applicant overcame this presumption by showing that there was in fact a significant and unexpected difference in the actual properties⁶ of the new compound as compared with the actual, albeit unknown to the prior art, properties of the known homolog.

The burden is on the applicant to rebut that presumption by a showing that the claimed compound possesses unobvious or unexpected beneficial properties not actually possessed by the prior art homolog. *Henze*, 181 F.2d at 201, 85 USPQ at 265 (emphases in original). This difference in properties was required to be shown to exist, whether or not the prior art suggested the property and utility discovered by the inventor for the new compound, and whether or not there was any reason to expect the prior art compound to have that property or utility. The court held:

It is immaterial that the prior art homologue may not be recognized or known to be useful for the same purposes or to possess the same properties as the claimed compound.

Id. (emphasis in original). The courts soon expressed dissatisfaction with this rule. See the discussion, and cases cited, in *In re Mills*, 281 F.2d 218, 126 USPQ 513 (CCPA 1960). In *Mills* the CCPA limited the *Henze* presumption to adjacent homologs, and rejected the PTO's interpretation of *Henze* as establishing a "legal presumption" of obviousness. The court held that homology alone does not create an inference of unpatentability or

⁴ A homolog is a chemical compound that differs from another compound only by one or more methylene groups. An "adjacent" homolog differs by precisely one methylene group. *Henze*, 181 F.2d at 200, 85 USPQ at 264.

⁵ As used in these decisions "property" and "utility" refer to the utilitarian property that compounds with 35 U.S.C. §101, and not to physical or chemical parameters not pertinent to patentability. *In re Krausz*, 347 F.2d 656, 659, 146 USPQ 25, 28 (CCPA 1965) ("a utility is really a manifestation of a 'property'").

³ 35 U.S.C. §103. A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. . . .

shift the burden of persuasion, but is simply a fact "which must be considered with all other relevant facts before arriving at the conclusion of 'obviousness' specified in 35 U.S.C. §103." *Id.* at 224, 126 USPQ at 518.

Throughout the 1960's, and thereafter, the CCPA stressed that properties as well as structure were material to the patentability of new chemical compounds, and *must* be considered. The case of *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) is often cited for its statement that "a chemical compound and all of its properties are inseparable." *Id.* at 391, 137 USPQ at 51. See *Papesch* for citation of a number of decisions of the CCPA and other courts after *Henze*, illustrating judicial understanding that chemical structure is not severable from chemical (including biochemical) properties in patentability determinations; for it is the properties that determine the utility that is requisite to patentability.

The *Papesch* court rejected the principle that this court now adopts, for in *Papesch* the court held that the prior art must disclose "at least to a degree" the applicant's desired property and utility. The court said:

The other factor of importance . . . is that the prior art disclosure was not merely of a structurally similar compound but also, at least to a degree, of the same desired property relied on for the patentability of the new compound. Such an "other factor" must of course be considered because it bears on the obviousness of the compound, which is, realistically and legally, a composite of both structure and properties.

Id. at 392, 137 USPQ at 52 (emphasis in original). The majority today disposes of this passage, long the bulwark of chemical practice, as "a brief mention", and "irrelevant" to the *prima facie* case. This passage has been reinforced myriad times after its appearance in *Papesch*, and has been a foundation of the *prima facie* case in examination of chemical patent applications for obviousness in terms of section 103.

Although the CCPA and the Patent Office at the time of *Papesch* did not generally use the terminology "*prima facie* case", the CCPA's holding that a compound is "realistically and legally, a composite of both structure and properties", underlies the requirement that both structure and properties be considered. *Papesch* and its extensive progeny establish that the prior art disclosure should be "at least to a degree, of the same

desired property", *id.*, even for a homology. Absent such disclosure, the presumption of unpatentability did not arise. This requirement, that both structure and properties be considered, simply continued when the terminology of the *prima facie* case was adopted to describe a legally sufficient case of obviousness under section 103.

In *In re De LaJaire*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964) the same principle was applied to a new composition. The CCPA held that similarity of chemical composition alone did not place on the applicant the obligation of proving that the prior art composition did not possess the applicant's newly discovered property and utility.

In the total absence of evidence in the record to indicate that the amber glass disclosed by Lytle would be expected to have desirable electrical insulating properties, we can find no justification for placing the burden on applicant to conducting experiments to determine the insulating properties of the colored glass disclosed by Lytle.

Id. at 874, 143 USPQ at 259. As in the modern usage of the *prima facie* case, the court held that the prior art must suggest both similar structure and property before the burden shifted to the applicant to prove unexpected differences. De LaJaire's claims were to a novel glass composition having insulating properties. The prior art (Lytle) reference showed a glass composition having what the examiner called "very slight differences" in structure, and the properties of amber color and durability. The court said: If one were making a colorless glass free of carbon and sulfur, there would be little reason for using the Lytle formula since it was primarily designed to enhance color stability. In the absence of any showing why it would be obvious to modify Lytle's glass, a "103 rejection" must be reversed. *Id.* at 875, 143 USPQ at 259.

In *In re Ruchig*, 343 F.2d 965, 145 USPQ 274 (CCPA 1965) the court again observed that the invention "indeed, is a conjunction of utility and product", though claimed as new compounds found to have the desired biological effect". (Emphasis in

* Dillon's tetra-orthoester is not a homolog of the tri-orthoester. Nor is it an isomer. The majority opinion simply describes the tri-orthoester and tetra-orthoester structures as having "a sufficiently close relationship", without the precision of past decisions.

* In Dillon's case such disclosure was absent. It is undisputed that Dillon's property of soot-reduction during combustion was not disclosed for the prior art compositions.

original). The court criticized the PTO position that "the examiner and the board thought the compounds, looked upon as mere chemical formulae, would have been obvious." *Id.* at 973, 145 USPQ at 281. The court stated:

On the obviousness issue, the vague "basket" disclosure of possible uses in the French and Swedish patents and the equally vague disclosure of the Martin patent are unimportant. What is important is the fact that the utility discovered by the appellants is not disclosed in the prior art. *Id.* at 977, 145 USPQ at 285 (emphasis in original).

That the utility discovered by the applicant must be at least suggested in the prior art, in order to establish *prima facie* unpatentability of new compounds and compositions that are structurally similar to known chemicals, is the common thread that ties most of the decisions of the CCPA and the Federal Circuit. I do not attempt to include all of the cases that illustrate this point. I do, however, include representative cases of divergent holding, and those that appear to be relied on by the majority.

For example, the Commissioner cites *In re de Montmolin*, 344 F.2d 976, 145 USPQ 416 (CCPA 1965) as supporting authority. In *de Montmolin* the claimed invention was a new compound, described by the applicant as useful for dyeing wool and cotton. The reference showed structurally similar compounds useful for dyeing wool. The court concluded that the additional ability of de Montmolin's claimed compound to dye cotton was not "sufficient to render the subject matter as a whole unobvious." *Id.* at 979.

* In *Ruchig* the court discussed the Commissioner's position that claims to compounds that are structurally similar to known compounds should "define" the newly discovered property on which patentability was based. The CCPA rejected such limitation, stating that "[v]aluable inventions should be given protection of value in the real world of business and the courts." 343 F.2d at 979, 145 USPQ at 286.

The majority of the court today, remarking that "the composition claims are not limited to [Dillon's] new use", hints that the result might be different if they were. *Ruchig* and other cases consistently rejected the proposition that claims to new compounds and compositions must contain a limitation to a specific use. Any change in this long-established practice requires careful thought. The majority also holds that Dillon's claim recitation of "a sufficient amount of [orthoester] to reduce the particulate emissions" is ineffective as a use limitation, adding uncertainty to claim draftsmanship.

145 USPQ at 417-18. This case simply illustrates determination of obviousness by comparing the structures and properties taught in the prior art with those disclosed by the applicant, and bringing judgment to bear on "the subject matter as a whole." *Id.* It does not support the position that a *prima facie* case under section 103 is made on structural similarity, regardless of the applicant's newly discovered property and use.

The principle that both structure and properties must be considered in connection with the *prima facie* case was directly treated in *In re Rosteler*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965), where the court held that "gross similarity" of chemical structure and the same area of pharmacological activity constituted a *prima facie* case of obviousness.

We agree with appellant's admonitions against deciding questions of chemical obviousness on the basis of structure alone, whether by means of a "mechanistic overlay" or otherwise. However, we think appellants have failed to present adequate evidence to overcome a *prima facie* showing of obviousness by reason of the admitted "gross structural similarities" of the art compounds, coupled with the fact that those compounds are shown to have utility in the same area of pharmacological activity.

Id. at 850, 146 USPQ at 185 (emphasis in original).

Other decisions during this period illustrate varying judicial emphases, depending on the facts. When the compounds were quite closely related in chemical structure, as in the homologs and analogs of *In re Riden*, 318 F.2d 761, 138 USPQ 112 (CCPA 1963), or the position isomers of *In re Mehta*, 347 F.2d 859, 146 USPQ 284 (CCPA 1965), the court gave greater evidentiary weight to the structural similarities than when the structures were less directly comparable. However, the court regularly admonished that: A compound is not, however, merely a structural formula; its properties as part of the whole must be considered.

Id. at 864, 146 USPQ at 287.

In *In re Lunsford*, 357 F.2d 380, 148 USPQ 716 (CCPA 1966) the court listed eight recent decisions in which it had rejected the Patent Office's position of "comparison of structures only".

Just how one finds the compounds "obvious" in the first instance, the examiner does not say, but apparently he envisions a comparison of structures only. That such an approach is not sanctioned by this court, although concededly the law was less well defined in June 1961, the date of

the Examiner's Answer, can be seen, e.g., in *In re Krazinski*, 347 F.2d 656, 146 USPQ 25 (CCPA 1965); *In re Ruschig*, 343 F.2d 965, 145 USPQ 274 (CCPA 1965); *In re Ward*, 329 F.2d 1021, 141 USPQ 227 (CCPA 1964); *In re Lunsford*, 327 F.2d 526, 140 USPQ 425 (CCPA 1964); *In re Riden Jr.*, 318 F.2d 761, 138 USPQ 112 (CCPA 1963); *In re Papezsch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963); *In re Paterling*, 301 F.2d 676, 133 USPQ 275 (CCPA 1962); *In re Lambory*, 300 F.2d 950, 133 USPQ 270 (CCPA 1962).

Id. at 382 n.2, 148 USPQ at 718 n.2 (emphasis in original). The court reiterated:

[T]he discovered activities or properties are part of the things claimed, the compounds. . . . [W]e, like the Patent Office, are required by the clear wording of section 103 to regard it as a relevant portion of the invention "as a whole."

Id. at 384, 148 USPQ at 720 (emphasis in original).

In a companion case, *In re Lunsford*, 357 F.2d 385, 148 USPQ 121 (CCPA 1966), the court again stressed that determination of obviousness must be based on both structure and properties. The court quoted the Patent Office position, in the examiner's words:

The argument that the "subject matter as a whole" under 35 U.S.C. 103 includes the compound and its utility is considered to be without merit.

Id. at 391, 148 USPQ at 725. The court once more firmly rejected that position:

[I]t is reasonably clear that the examiner considered only the difference in structures between the claimed compounds and the prior art compounds.

Appellant was entitled to have differences between the claimed invention, the subject matter as a whole, and the prior art references of record evaluated.

Id. (emphasis in original). Referring to 35 U.S.C. §103, the court wrote:

It is not believed that [a person of ordinary skill in the art] would consider only the structures of the compounds[.]

Id. (emphasis in original).

These judicial analyses, written before the terminology of the *prima facie* case became routine in patent examination, nonetheless placed the burden on the examiner to come forward with prior art sufficient to support any purported suggestion of the applicant's properties.

Moreover, as a matter of law under 35 U.S.C. 103, the examiner must substantiate his "suspicions" on the basis of facts drawn from proper prior art. The issue to

be resolved requires more than "suspicions"; it requires facts.

Id. (footnote omitted, emphasis in original). The CCPA put "structural obviousness" in perspective when, again receiving this argument from the Commissioner, the court commented on the large numbers of yet-unmade compounds that would be "structurally obvious" to a chemist:

The solicitor has reargued in his brief the question of the obviousness of chlorpropamide to a chemist as a compound, that is, what we sometimes refer to as its "structural obviousness." This is not a matter of dispute. We think appellant would concede that all 1,237,464 compounds he claims to be within the Ruschig et al. disclosure or the 38,556 compounds he claims to be within the broadest patent claim, are structurally obvious.

In re McLamore, 379 F.2d 985, 989, 154 USPQ 114, 117 (CCPA 1967). Indeed, few of today's new chemicals have such imaginative structure that structurally similar compounds are not to be found in the prior art. Nonetheless, the reasoning rejected in *McLamore* appeared two years later in the CCPA decision *In re Mod*.

In re Mod, 408 F.2d 1055, 161 USPQ 281 (CCPA 1969) was described by the Commissioner as "on all fours" with Dillon's facts. Mod's new compounds were adjacent homologs and isomers of known compounds that were described in the prior art as insecticides. Mod's compounds had "antimicrobial activity against a variety of micro-organisms such as bacteria, yeast, and molds." *Id.* at 1055, 161 USPQ at 282. The court held Mod's compounds unpatentable for obviousness, referring to the close similarities of structure and remarking that Mod "did not deny" that his new compounds had insecticidal activity. The court in *Mod* did not discuss a "prima facie case", but stated that it was not sufficient for patentability that the antimicrobial activity of Mod's new compounds was unknown to the prior art. *Id.* at 1057, 161 USPQ at 283. In a decision analogous to the majority's holding today, the CCPA held that because Mod's new compounds would

have been obvious for the prior art use as insecticides, they were unpatentable despite Mod's discovery of a "significant" new property. *Id.*

Mod has often been distinguished. See, e.g., *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975), wherein the court directly contradicted *Mod*, as follows:

We are of the opinion that a novel chemical compound can be *nonobvious* to one having ordinary skill in the art notwithstanding that it may possess a known property in common with a known structurally similar compound.

Id. at 1395-96, 185 USPQ at 590 (emphasis in original). With rare exceptions *Mod* has not been followed, until today.

Continuing the chronological review: *In re Jones*, 412 F.2d 241, 162 USPQ 224 (CCPA 1969) the court upheld the rejection of composition claims to a blend of polypyrrole and an asbestos filler as *prima facie* obvious, for the reason that "the prior art suggests the combination generally for the primary purpose (i.e., improved structural rigidity) for which it was made." *Id.* at 244, 162 USPQ at 226. Comparative data were properly required, for both structure and properties were suggested in the prior art.

The procedural and substantive rigor of the *prima facie* case in patent examination is again illustrated in *In re Godron*, 428 F.2d 834, 166 USPQ 327 (CCPA 1970), wherein the court held that since a *prima facie* case of obviousness was not made as to a new glass composition having new and unobvious properties, it was unnecessary for the applicant to prove whether the prior art composition had the same property (the ability to wet graphite) as the applicant's composition.

"The facts in *Mod* are indeed on all fours with the facts now before us. In *Mod* the court held that the apparently shared property of insecticidal activity sufficed to make Mod's new (but structurally similar) compounds unpatentable for obviousness, despite Mod's discovery that his new compounds had the new property of antimicrobial activity. In Dillon's case the court holds that the presumptively shared property of water sequestration suffices to make Dillon's new (but structurally similar) compositions unpatentable for obviousness, despite Dillon's discovery that her new compositions have the new property of root reduction. In neither case did the prior art suggest or make obvious the applicant's newly discovered property. The absence of the term "*prima facie* case" from the *Mod* opinion does not distinguish it from the majority's holding today. A conclusion of obviousness must be legally sufficient under the statute, and for both *Mod* and Dillon the courts held that on similar facts this conclusion is compelled as a matter of law."

We agree that it is improper to require comparative evidence where a reference is devoid of any suggestion of the claimed invention.

Id. at 855, 166 USPQ at 329.

This procedure was similarly applied to chemical process claims. For example, in *In re Freed*, 425 F.2d 785, 165 USPQ 570 (CCPA 1970) the claimed invention was a single-step process for producing calcium pantothenate. The CCPA held that the examiner had failed to support a *prima facie* case, since the prior art disclosed only a two-step process. Since a *prima facie* case was not made, the court held that it was unnecessary to show unexpected results. *Id.* at 788 & n.5, 165 USPQ at 572 & n.5. See also, e.g., *In re Alul*, 468 F.2d 939, 943, 175 USPQ 700, 703-04 (CCPA 1972) (since *prima facie* case not established, no need to consider contentions of unobvious results).

In *In re Kuderma*, 426 F.2d 385, 165 USPQ 575 (CCPA 1970) the board held that a claimed carbamate compound, having utility as an insecticide, was *prima facie* obvious in view of structurally similar known carbamates described in the prior art as useful as insecticides. The court held that the applicant's showing of superior results demonstrated unobviousness, in view of the entirety of the relevant teachings of the prior art and the absence of anything "on which to base a prediction of the comparative insecticidal activities" of these carbamate compounds. *Id.* at 390, 165 USPQ at 579.

In *In re Hoch*, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970) the reference described a known compound and its use for "treatment of plant diseases"; the court held that a *prima facie* case of obviousness was made as to the applicant's structurally similar compound disclosed to be useful as a herbicide, stating:

On the face of it, "treatment of plant diseases" could mean usefulness in controlling plant-infesting organisms. . . . We are thus not persuaded that herbicidal properties are "contraindicated" by the [prior art] patent. *Id.* at 1343, 166 USPQ at 408-09. *Hoch* simply illustrates the court's consideration of the closeness of the chemical structures (the only difference was between an acid and its ethyl ester) and the court's stated uncertainty about the relationship of the properties shown in the prior art and those disclosed by the applicant, in deciding whether a *prima facie* case was made.

The classical reasoning of the *prima facie* case is again illustrated for composition claims in *In re Sust*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). A composition

comprising a polymer and a stabilizer was held *prima facie* obvious because a similar combination was suggested in the prior art for the same purpose, and Susi's stabilizer compounds were similar in structure to known compounds having the known property of stabilizing similar polymers. *Id.* at 444, 169 USPQ at 425. Thus a showing of unobvious results was properly required, for both structure and properties of the new composition were suggested in the prior art.

Another routine illustration of the *prima facie* case based on similarity of both structure and properties, between the prior art and the claimed compound, is seen in *In re Ackermann*, 444 F.2d 1172, 170 USPQ 340 (CCPA 1971). The board had rejected claims to an optical brightening agent as *prima facie* obvious from references describing structurally similar compounds having pronounced fluorescence and optical brightening properties. The CCPA agreed that a *prima facie* case had been made, since the references also suggest that the art would expect the class of compounds as a whole to possess the general property of optical fluorescence, but the court reversed on the question of sufficiency of the rebuttal evidence. *Id.* at 1176, 170 USPQ at 342-43.

In *In re Stenmiski*, 444 F.2d 581, 170 USPQ 343 (CCPA 1971) the court again held that similarity of structure alone was insufficient for *prima facie* unpatentability. The claimed new compounds were analogs of known diaryl-in compounds, and the known compounds were described as having no established utility, although utilities were suggested by the court. The court observed that the prior art provided no motivation to make the claimed compounds for applicant's purpose, although "one of ordinary skill would suppose the properties or potential uses of the two groups of compounds would be similar." *Id.* at 585, 170 USPQ at 347."

"There is extensive precedent relating to chemical compositions as well as chemical compounds; see the sampling herein. The statement by the majority that its *in banc* holding does not "necessarily" apply to "all cases" of chemical compositions will not add clarity and stability to the law. The court's holding today must be followed by patent examiners and patent applicants, and while I dissent from it, it is essential that inventors and examiners, producing and processing 150,000 new patent applications annually, know the law and practice that will control patentability.

"As pointed out at n.2, *supra*, the facts illustrated in *Stenmiski*, where the prior art compounds assertedly had no known use, are the only circumstance wherein the majority allows that

The *Stenmiski* court remarked on "this court's failure to render consistent precedent" on the issue of structural obviousness, *Id.* at 585, 170 USPQ at 347, stating that *Henze*, its predecessors and its progeny have met with their share of criticism over the years, both in this court, in other courts, and elsewhere.

Id. at 587, 170 USPQ at 348 (footnote omitted). The court confronted the Commissioner's argument on the sufficiency of structural similarity alone, and held:

To the extent that *Henze* and *Riden* are inconsistent with the views expressed herein, they no longer will be followed, and are overruled.

Id. at 587, 170 USPQ at 348.

In *In re Murch*, 464 F.2d 1051, 175 USPQ 89 (CCPA 1972) the claims were directed to new polymer compositions described as having certain properties of toughness. A *prima facie* case was deemed made based on similar properties of toughness described for a similar polymer compositions in the prior art; and was held rebutted based on evidence of improved weld line toughness. *Id.* at 1056, 175 USPQ at 92. Although the majority today cites *Murch* as supporting authority for "structural obviousness", the court in *Murch* distinguished *Mod* and *de Montmollin*, and reaffirmed reliance on *Papesch*. *Murch* is remote from a holding of *prima facie* obviousness based on structural similarity alone.

In *In re Freeman*, 474 F.2d 1318, 177 USPQ 139 (CCPA 1973) the court again distinguished *Mod* and *de Montmollin*, which had again been cited by the Commissioner for the position that structural similarity alone suffices to support a *prima facie* case of obviousness. The court stated:

We have recently pointed out that the rule derived from *Mod* and *de Montmollin* by the Patent Office is not supported by those cases.

Id. at 1322, 177 USPQ at 142. The court discussed the principle of the *prima facie* case as applied to section 103, explaining that if the evidence of obviousness of the claimed subject matter

is strong enough to establish a *prima facie* case, i.e., one which would prevail in the absence of rebuttal evidence, we must go

structural similarities alone do not make a *prima facie* case of obviousness under section 103. While a chemical compound may be of solely theoretical interest, it is hard to imagine a composition (or a mechanical device) with no known use; thus this exception has scant practical significance with respect to compositions and mechanical devices.

on to examine the evidence of non-obviousness before the legal conclusion called for by section 103 can be reached.

Id. The court stressed the need to consider all the evidence.

The claimed invention in *In re Mochele*, 470 F.2d 638, 176 USPQ 194 (CCPA 1972) was sodium glass compositions containing magnesium oxide, a component known for use in lithium glass compositions. The court held:

No suggestion appears in the record of a purpose for including MgO in sodium glasses and no teaching of identical effects of secondary components in sodium and lithium glasses. We do not consider it "fair to assume" [quoting the examiner] such identity. We cannot, therefore, sustain the finding of *prima facie* obviousness.

Id. at 641, 176 USPQ at 196.

In *In re Ceston*, 474 F.2d 1331, 177 USPQ 264 (CCPA 1973) the court reversed the rejection of compound claims, where the board had relied on known methods of making the compounds as evidence of obviousness, and the examiner had "totally disregarded" the showings of improved properties. The court stated:

It has long been our position that a compound and its properties are inseparable and that no property can be ignored in determining patentability over the prior art.

Id. at 1334, 177 USPQ at 266. The court found that the prior art did not suggest a relationship between the change in chemical structure and the applicant's phototropic properties. The court stated that it was insufficient that this type of chemical modification was known:

Nothing in the prior art suggests any relationship between ortho substitution in the 2-phenyl ring [the structural difference from the prior art] and the properties disclosed and illustrated in appellant's specification.

Id. at 1334, 177 USPQ at 266-67. The court quoted with approval the following statement from *In re Larsen*, 292 F.2d 531, 533, 130 USPQ 209, 210 (CCPA 1961), *cert. denied*, 370 U.S. 936 [133 USPQ 703] (1962):

Since there was nothing to indicate that the compounds, when made, would have these properties, it was not obvious to make the compounds. In such a case the allowance of claims to the compounds must depend on the proposition that it was unobvious to conceive the idea of producing them, within the meaning of Title 35 U.S.C., Section 103.

Ceston, 474 F.2d at 1334, 177 USPQ at 266.

These cases illustrate the CCPA's continuing rejection of the "structural obviousness" theme, on the rationale that unless there was a reason or motivation shown in the prior art to make the particular structural change that the applicant made, in order to achieve the properties that the applicant was seeking, "it was not obvious to make the compounds." *Id.* As the court explained, the "idea" of new compounds is not separable from the properties that were sought by the inventor when making the compounds. Structure and properties are essential components of "the invention as a whole", in the words of section 103.

In *In re Taborsky*, 502 F.2d 775, 183 USPQ 50 (CCPA 1974) the prior art described a large number of isomers and analogs of the applicant's compounds. Taborsky's products were "halogen" compounds, discovered to be useful as selective piscicides against brown bullhead fish and as larvicides to control sea lampreys. The prior art compounds were described as controlling gastropods and snails. The *Taborsky* decision illustrates the care with which the court compared, compound by compound, the applicant's and the prior art's disclosure of structures and properties. As to the applicant's chlorine, bromine, and iodine analogs, the court remarked that it was unnecessary to pass on the issue of whether a *prima facie* case were made by the prior art's disclosure of related compounds containing these three halogens, because such case, if made, had been overcome by evidence of the comparative effectiveness of these compounds as larvicides to control sea lampreys. *Id.* at 781, 183 USPQ at 55. As to the fluorine analogs, the *Taborsky* court held that the board's holding of *prima facie* obviousness "because of structural similarity to the cited prior art" could not stand, since there was "no motivation to make the proposed molecular modifications needed to arrive at appellant's claimed fluoro-substituted compounds." *Id.* at 780-81, 183 USPQ at 55. The court held that it was not necessary for the applicant to compare actual properties of the new and the prior art compounds. Since we hold that the prior art of record fails to establish that the fluoro-substituted compounds recited in appellant's claims are *prima facie* obvious, it is unnecessary to consider any comparative evidence with respect to the properties of these compounds.

Id. at 781, 183 USPQ at 55. Only when the *prima facie* case was established by the prior art was the applicant required to develop comparative evidence. It

is as much an obligation to avoid imposing unnecessary burdens on the applicant, and on the Patent Office, as it is to assure compliance with the law. See, e.g., *In re Seigneurin*, 474 F.2d 1020, 1023, 177 USPQ 257, 259 (CCPA 1973) (since no *prima facie* case of obviousness was made for a catalyst component of a chemical process, "[t]hat concludes the matter"); *In re Fischer*, 484 F.2d 961, 963-64, 179 USPQ 304, 306 (CCPA 1973) (no *prima facie* case, therefore no need to show unexpected results of claimed method). While the CCPA did not always decline to consider such evidence when it was already of record, the principle underlying orderly patent examination is that the burden in the first instance is on the examiner to establish that the claimed invention is *prima facie* unpatentable based on the prior art.

The no-utility exception that is recognized in the majority opinion is seen in the following case. In *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975) (*Albrecht* 1), the prior art compounds were described as anesthetics that had the disadvantage of being skin irritants and therefore were not of practical use. Albrecht's new compounds were antiviral agents. The claims were rejected as *prima facie* obvious based on similarity of structure. In the examiner's words:

Where such closely structurally related compounds are concerned, actual unexpected differences in properties are required to overcome a *prima facie* case of obviousness. Even though the present compounds may exhibit an unexpected property as antivirals, they are obvious as anesthetics.

Id. at 1392, 185 USPQ at 587 (emphasis in original). The Commissioner argued that Albrecht must prove that his new compounds were not anesthetics. The court disagreed, holding that the properties shown in the prior art did not provide the "necessary impetus" to make Albrecht's compounds. *Id.* at 1396, 185 USPQ at 590. The court also reaffirmed that properties must always be considered:

This court has several times recently expressed its position on the role of the properties of chemical compounds in assessing their obviousness under §103. See *In re Taborsky*, 502 F.2d 775, 183 USPQ 50 (CCPA 1974); *In re Blondel*, 499 F.2d 1311, 182 USPQ 294 (CCPA 1974); see further *In re Murch*, 464 F.2d 1051, 175 USPQ 89 (CCPA 1972); *In re Lintner*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972).

Id. at 1394, 185 USPQ at 588-89. The court observed that Albrecht's newly discovered antiviral property is "totally dissimilar" to

the properties disclosed for the prior art compounds, and is "not to be ignored".

A newly discovered activity of a claimed novel compound which bears no material relationship to the activity disclosed for the prior art analogs is further evidence, not to be ignored, of the nonobviousness of the claimed invention.

Id. at 1396, 185 USPQ at 590. The court reversed the rejection.

In *In re Albrecht*, 514 F.2d 1385, 185 USPQ 590 (CCPA 1975), decided the same day, the court held, as to other related compounds, that a *prima facie* case was made based on structural similarity to the compounds of the same prior art reference as in *Albrecht* 1. The court disposed of the Commissioner's position that the applicant should have provided comparative data with the anesthetic property of the prior art compounds, as follows:

There seems to be little doubt that the Patent and Trademark Office would not have entertained such a comparison if initiated by appellants because they have no support in their specification for use of the claimed compounds as anesthetics. See *In re Davies*, 475 F.2d 667, 177 USPQ 381 (CCPA 1973).

Id. at 1389, 185 USPQ at 593. The court correctly observed that comparative data, when required to rebut a *prima facie* case, should relate to the new property and use discovered by the applicant, not an unrelated known use of the prior art products.

In *In re Lombardi*, 545 F.2d 747, 192 USPQ 278 (CCPA 1976) certain new compounds having germicidal activity were rejected as *prima facie* obvious over structurally similar compounds described as biological toxicants, a use that the court found may include germicidal activity, although not necessarily. *Id.* at 750, 192 USPQ at 280. Rebuttal evidence was adduced and found insufficient. The court concluded:

In view of the foregoing, and considering the claimed invention as a whole vis-à-vis the evidence produced by the PTO, which shows both a close structural similarity between the prior art compounds and the claimed compounds and a close similarity between the disclosed uses, we hold that appellants' invention would have been obvious to one of ordinary skill in the pertinent art.

Id. at 751, 192 USPQ at 281 (emphasis added).

The majority has cited *In re Sherry*, 566 F.2d 81, 195 USPQ 753 (CCPA 1977). Sherry's new compounds were homologs of prior art as antiviral agents, whereas Shet-

ty's compounds were discovered to have appetite-suppressant activity. Diverging from the weight of its precedent, the court held that a *prima facie* case was made based on the close similarities of chemical structure. Since Sherry did not prove that there were actual differences in properties, the composition claims were not allowed.

However, the Sherry court allowed the process claims (to the new use),¹¹ without requiring such proof. The court said, following precedent:

The Patent Office has failed to show a reasonable expectation, or some predictability, that [a reference] compound would be an effective appetite suppressant if administered in the dosage disclosed by [another reference].

Id. at 86, 195 USPQ at 756. In contrast, the majority today affirms the rejection of Dillon's claims, process and composition, although such "expectation" or "predictability" was, without dispute, absent.

Despite the occasional aberration illustrated by Sherry, the CCPA decisions became remarkably consistent in requiring that both structure and properties must be suggested in the prior art before a *prima facie* case of obviousness was deemed made, whether for composition claims or process claims. E.g., *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978), wherein the prior art compounds were isomers of May's compounds, and showed the same analgesic activity. A *prima facie* case was conceded as to composition and the process claims, and overcome by rebuttal evidence of the non-adaptiveness of May's compounds, an attribute that was shown to be unpredictable.

Similar reasoning was applied to claims to a new use of a known compound in, e.g., *In re Herscher*, 591 F.2d 693, 200 USPQ 711 (CCPA 1979), wherein the use of the known compound MSO (dimethyl sulfoxide) to enhance steroid penetration through skin tissue was held by the board to be *prima facie* obvious from references showing DMSO in hair lotion preparations that may contain estrogenic hormones (steroids). The court reversed, holding that "[t]he references do not provide any impetus to do what appellant has done." *Id.* at 702, 200 USPQ at 718-19. In the absence of a *prima facie* case, appellant's rebuttal evidence was unnecessary.

¹¹ A new use is claimed as a process, in accordance with 35 U.S.C. §100(b):

The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

We do not find it necessary to reach the question of the weight to be given the papers presented to the New York Academy of Sciences in that appellant has no *prima facie* showing of obviousness to rebut.

Id. at 702 n.9, 200 USPQ at 719 n.9.

Over the remaining years of the CCPA's existence its opinions were steadfast in requiring consideration of both structure and properties in determinations of *prima facie* obviousness. Precedent had ripened, as exceptions diminished. See *Korrekos v. United States*, 328 U.S. 750 (1946), wherein the Supreme Court discusses how case by case determination on a variety of facts in time shows the direction of the law:

For, as with all lines which must be drawn between positive and negative fields of law, the precise border may be indistinct, but case by case determination of particular points adds up in time to discernible direction.

328 U.S. at 761-62.

Further illustrations of the direction established by precedent are, e.g., *In re Swann*, 582 F.2d 638, 641, 199 USPQ 137, 139 (CCPA 1978):

In view of the close structural similarity between the claimed compounds and [the prior art compound], and the fact that the latter is disclosed as possessing antimicrobial activity, we believe that one skilled in the art would have been, *prima facie*, motivated to make the claimed compounds in the expectation that they, too, would possess antimicrobial activity.

In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979), the court stated:

The similarity in structure and properties between the prior art and claimed compounds is sufficiently close to support a *prima facie* case of obviousness.

Id. at 314, 203 USPQ at 255. The court explained:

An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound in the expectation that compounds similar in structure will have similar properties.

Id. at 313, 203 USPQ at 254.

In *In re Grunwell*, 609 F.2d 486, 203 USPQ 1055 (CCPA 1979) the court held that a *prima facie* case of obviousness was made for certain new steroids, and not for others. For compounds where the structures differed from the prior art only in a methyl substituent, and the physiologic and psychologic properties were similar, a *prima facie* case was deemed made. *Id.* at 491, 203

USPO at 1059. Other Grunwell steroids were others, while the closest structures in the prior art were alcohols; in that case the court held that a *prima facie* case was not made, because the examiner had not shown why one skilled in the art would have replaced this hydroxyl group with an ether. *Id.*

Similar reasoning was applied to process claims in *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980). Claims to the use of new polymeric exchange resins to remove corrosion products in a steam system were rejected as *prima facie* obvious from references describing structurally similar polymers used for the same purpose. However, the court found that the PTO did not make a *prima facie* case as to claim 8 because of temperature limitations not shown in the prior art. Therefore:

Since the PTO had not made out a *prima facie* case of obviousness respecting claim 8, evidence of comparative testing was unnecessary in rebuttal.

Id. at 1036, 206 USPQ at 296. Again in *In re Zeller*, 682 F.2d 961, 215 USPQ 490 (CCPA 1982) a *prima facie* case was deemed made based on similarity of structure and of properties:

One of ordinary skill would have had reason to expect, given the close structural similarity of the [reference] compounds and the teachings of [another reference], that use of a sulfonamide bridge... would have resulted in dyes possessing the same or only slightly different properties from prior art dyes.

Id. at 966, 215 USPQ at 494. The *prima facie* case was held rebutted as to one claimed dye compound, but not as to another. *Id.*

The Federal Circuit did not stray from this precedent. As summarized in *In re Grablak*, 769 F.2d 729, 731, 226 USPQ 870, 871 (Fed. Cir. 1985):

When chemical compounds have "very close" structural similarities and similar utilities, without more a *prima facie* case may be made.

The rule also continued to be applied to process (use) claims, as illustrated in *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ

"Although the majority states that it is 'not retreating from the recent trend of case law,' the cases over the past thirteen years (since *Sherry*) do not support this view. The courts have generally required that there be a suggestion in the prior art that structure have made obvious not only the chemical structure but also the newly discovered property of a new chemical compound or composition, in order to make a *prima facie* case under section 103.

375 (Fed. Cir. 1986), wherein the court held that "close structural similarity and a similar use" of the applicant's known compound and the prior art compound made a *prima facie* case of obviousness of claims to the asserted new use. *Id.* at 1097, 231 USPQ at 379.

In *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276 (Fed. Cir. 1987) the Federal Circuit held that although the prior art disclosed the separate components of the claimed new compositions, for the same general use of treating cooling water systems, a *prima facie* case was not established "absent some teaching, suggestion or incentive supporting the combination." The court held that:

Because we reverse on the basis of failure to establish a *prima facie* case of obviousness, we need not reach the issue of the sufficiency of the showing of unexpected results.

Id. at 688, 2 USPQ2d at 1278.

In *In re Chapp*, 816 F.2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987) the applicant did not challenge the board's holding that a new compound useful as a herbicide was *prima facie* obvious in view of the prior art showing of an adjacent homolog and other structurally similar compounds used as herbicides. However, the court found the rebuttal evidence of differences in selectively sufficient to hold the composition claims allowable. *Id.* at 647, 2 USPQ2d at 1440.

In *Chapp* the court disposed of the Commissioner's policy argument that grant of the composition claims would prevent the public from using Chapp's structurally obvious compound for the herbicidal uses shown in the prior art, with the remark that "the expectation that persons would want to use the compound to produce inferior results (or would want to fight lawsuits over such uses) is false." *Id.* at 647, 2 USPQ2d at 1440.

The Federal Circuit has not applied the standard of *prima facie* obviousness that the majority today "reaffirms", but has consistently considered properties and use as well as structure. The only decision referred to by the majority is *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988), as if *Wright* stood alone in its requirement that the inventor's desired properties and use must be considered. *Wright* dealt with a mechanical device, and is in the mainstream of this precedent. In *Wright* we said:

The determination of whether a novel structure is or is not "obvious" requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art.

Id. at 1219, 6 USPQ2d at 1361 (citations

omitted). Not one of the myriad cases wherein the courts had required consideration of these factors is mentioned or distinguished by the majority, although presumably all are now overruled. In this already-lengthy survey I have not included mechanical cases whose rationale is stated in the same terms as that of *Wright*.²² Nonetheless the *in banc* court today overrules *Wright*, without argument or briefing, and extends to mechanical devices the same theory of structural obviousness that the court now applies to chemicals, discarding the extensive precedent to the contrary.

The Court stated in *Thomas v. Washington Gas Light Co.*, 448 U.S. 261, 272 (1980):

"*Wright* claimed a new carpenter's level, having the new property and use of enhanced pitch measurement. *Wright's* new structure was a combination of elements that were in the prior art, but there was no suggestion in the prior art that this new combination might have the property and use discovered by *Wright*. The panel explained that it was unobvious to make this combination to solve the problem of increasing pitch measurement: a rationale appearing in dozens of decisions. See, e.g., *Lindemann Maschinenfabrik GmbH v. American Holt and Derrick Co.*, 730 F.2d 1432, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

"(Nothing in the references alone or together suggests the claimed invention as a solution to the problem of crushing rigidly massive scrap"). *In re Benno*, 768 F.2d 1340, 1347, 226 USPQ 683, 687 (Fed. Cir. 1985). ("[Benno] had to invent a solution to that problem... Neither reference hints at his solution"). *Weather Engineering Corp. of America v. United States*, 614 F.2d 281, 287, 204 USPQ 41, 46-47 (Ct. Cl. 1980). ("The near unanimous approach by the courts is that '[t]he prior art that is relevant in evaluating a claim of obviousness is defined by the nature of the problem confronting the would-be inventor'"). *In re Naber*, 494 F.2d 1405, 1407, 181 USPQ 639, 641 (CCPA 1974). ("even if one of ordinary skill in the art were moved to combine the references, there would be no recognition that the problem of combustible deposits had been solved"). *In re Aughauer*, 399 F.2d 275, 281, 158 USPQ 351, 355 (CCPA 1968). ("as in *United States v. Adams*, 383 U.S. 39 [148 USPQ 479] (1966), what applicant had done was to observe an existing problem in the art which had not been solved by the prior art and then combine individually old concepts to solve that problem"). (emphasis in original). *Re Rollemel*, 276 F.2d 393, 125 USPQ 328, 331 (CCPA 1960). ("Where the invention for which a patent is sought solves a problem which persisted in the art, we must look to the problem as well as its solution if we are to properly appraise what was done and to evaluate it against what would be obvious to one having the ordinary skills of the art"). *In re Raitt*, 270 F.2d 810, 813, 123 USPQ 349, 351 (CCPA 1959) (the prior art did not teach "how to solve the problems" faced by the inventor).

Many other decisions apply similar reasoning, contrary to the majority's holding today.

When rights have been created or modified in reliance on established rules of law, the arguments against their change have special force.

At least, the majority should explain its reasoning for so far-reaching a change of law and practice, affecting patentability of mechanical devices as well as chemical compounds and compositions.

D The Statute

The court's *in banc* holding that similarity of chemical (and mechanical) structure suffices for *prima facie* unpatentability under 35 U.S.C. §103, even when the applicant's newly discovered properties and use are not suggested in the prior art, departs from the precepts of not only section 103, but also sections 101 and 102. The court today imposes the same rebuttal burden on the applicant regardless of whether the prior art suggests the applicant's newly discovered properties.

35 U.S.C. §103 requires that obviousness be determined in light of the prior art; section 102 fixes the limits of prior art; and section 101 requires utility as a condition of patentability. Giving consideration to the newly discovered properties and utility as well as the structure of a new chemical compound or composition (or a new device) implements the requirement of section 103 that the invention be viewed as a whole. *Jones v. Hardy*, 727 F.2d 1524, 1529, 220 USPQ 1021, 1025 (Fed. Cir. 1984). ("Failure to consider the claimed invention as a whole is an error of law"). *In re Kuehl*, 475 F.2d 658, 664-65, 177 USPQ 250, 255 (CCPA 1973). ("The test under §103 is whether in view of the prior art the invention as a whole would have been obvious at the time it was made"). As the court remarked in *Lundford*, it is unlikely that a person of ordinary skill would consider only the structures, and not the properties, described in the prior art.

The factual determination of the scope and content of the prior art, see *Graham*, 383 U.S. at 17, 148 USPQ at 467, is, of course, directed to prior art that meets the conditions of section 102. Section 102 describes prior art as what is published or otherwise known, including subject matter in public use or on sale. Not included is what is unknown, or knowledge that became known to the inventor through the inventor's own research.

To rely on an equivalence known only to the applicant to establish obviousness is to

assume that his disclosure is a part of the prior art. The mere statement of this position reveals its fallaciousness.

In re Ruff, 256 F.2d 590, 598, 118 USPQ 340, 347 (CCPA 1958) (emphasis in original). Indeed, this principle was recently modified by Congress in 35 U.S.C. §103, second paragraph (1984) (prior art does not include certain information of common ownership). When the prior art does not suggest that similar structures will have the property and use that the inventor discovered, such fact can not be used to support rejection of the claims, even when the inventor included such information in the patent application.

35 U.S.C. §101 requires that an invention be useful. The use of a chemical is the utilitarian property of that chemical. Since the essence of the *prima facie* case is that the holding of unpatentability is legally complete, the property and utility can not be ignored. Consideration of the utility of the claimed invention is as integral to the examiner's determination of *prima facie* unpatentability as it is to the decision after any rebuttal evidence is submitted.

The decisions I have discussed, and many others, illustrate the breadth of the court's exposure and the depth of the court's understanding, evolved over more than thirty years of application of these statutory principles. The weight of precedent, well exceeding the sampling I have reported, contradicts the majority's holding, and has established powerful legal principles that should not be discarded without sound reason. As discussed by the Supreme Court in *Vasquez v. Hillery*, 474 U.S. 254, 265 (1986),

... ensure that the law will not merely change erratically, but will develop in a principled and intelligible fashion. That doctrine permits society to presume that bedrock principles are founded in the law rather than in the proclivities of individuals. . . .

The law of *prima facie* obviousness had developed over a long history, knitting the common threads of many carefully considered cases, leading to unifying criteria, in the tradition of the common law.

The court has made the wrong choice in reviving the *Hass-Heine* presumption of obviousness based on chemical structure without consideration of the obviousness of the applicant's new properties. This presumption was criticized, limited, and overruled, and has been superseded by judicial appreciation that a chemical "is, realistically and legally, a composite of both structure and properties," in the words of *Papesch*. I repeat the unifying criterion that for a new chemical compound or composition a *prima facie* case

of obviousness is made when both (1) the new compound or composition is of closely related chemical structure to the prior art compound or composition, and (2) there is some suggestion or motivation arising in the prior art to make the new compound or composition in order to achieve the inventor's desired properties and utility. When these requirements were met, appropriate evidentiary showings could rebut the *prima facie* case. Only an occasional exception among past decisions eliminated the second part of this unifying criterion, and required proof of actual differences in properties when there was no suggestion in the prior art of the properties discovered by the inventor. Today the aberration becomes the law, reversing over thirty years of reasoned legal analysis.

The court does not state what new statutory interpretation is invoked, what new policy or principle is served, by rejecting the reasoning of so many decisions. The Supreme Court has remarked that any detours from the straight path of *stare decisis* in our past have occurred for articulable reasons, and only when the Court has felt obliged "to bring its opinions into agreement with experience and with facts newly ascertained."

Vasquez, 474 U.S. at 266 (quoting *Burnet v. Coronado Oil & Gas Co.*, 285 U.S. 393, 412 (1932) (Brandeis, J., dissenting)). When our court makes so dramatic a change of law, its *ratio decidendi* should be made known.

DILLON'S INVENTION

Dillon's patent application discloses and claims her discovery that the inclusion of certain tetra-orthoester compounds in hydrocarbon fuel compositions will reduce the emission of solid particulates (*i.e.* soot) during combustion of the fuel. The tetra-orthoesters are a known class of chemical compound. It is undisputed that their combination with hydrocarbon fuels, for any purpose, is not described in the prior art; nor is their use to reduce particulate emissions from combustion of hydrocarbon fuels.

Dillon's Appeal to the Board

An applicant is required to appeal from all of the examiner's rejections that the applicant wishes to contest. 37 C.F.R. §1.191(c). Dillon did so, and appealed the rejection of claims 2-14, 16-22, and 24-37. Of these, claims 24-35 were process (use) claims and

the others were composition claims. The appealed rejections were directed to the process and composition claims together, and were described by the board as follows:

1. Claims 24 through 37 under 35 U.S.C. 112, second paragraph.
 2. Claims 2 through 14, 22 and 34 through 37 under 35 U.S.C. 103 as unpatentable over Sweeney '417 in view of Elliott, Howk, Kesslin, Speh, and Neves.
 3. Claims 16 through 22, 24 through 33, 35, 36 and 37 under 35 U.S.C. 103 as unpatentable over Sweeney '267 or '417 in view of Elliott, Howk, Kesslin and Speh.
- Board op. at 2. In its decision the board wrote that composition and method of use claims were at issue:

The appealed subject matter relates to compositions comprising a hydrocarbon fuel and a particulate emissions suppressing amount of an organic orthoester, and a method of reducing particulate emissions by combusting such compositions.

Board op. at 1.

Dillon duly argued each group of rejection, in accordance with 37 C.F.R. §1.192, and the examiner responded. The board reversed the examiner's rejection on section 112, for all the claims rejected on that ground, and affirmed the rejections on section 103, for all the claims rejected on that ground. Each ground encompassed composition and process claims, without distinction. (The board also discussed claims 13, 14, 34, 36, and 37, as to aspects not here material.)

Analyzing all the claims with respect to section 103, the board did not distinguish among them. For example, the board stated that

... differences between applicant's and the prior art's motivation for adding a component to a composition will not alone render the claimed *composition*, or *process* unobvious.

Board op. at 7 (emphasis added). The board further stated, again as to all the claims, that

The mere recitation of a newly discovered function inherently possessed by *things and processes* in the prior art does not cause claims drawn thereo to distinguish over that prior art.

Board op. at 8 (emphasis added). Throughout its opinion the board did not imply that its analysis was directed solely to the composition claims. Indeed, the board stated that the use of the orthoesters recited in the appealed claims (wherein R is -OR) as hydrocarbon fuel additives would clearly have been *prima facie* obvious from the teachings of the Sweeney patents alone and the close chemical and structural relationship between Sweeney's and appellant's orthoesters.¹

Board op. at 6 (emphasis added). The majority errs in its statement that the board "reviewed" only the composition claims. The board considered and rejected all the claims, drawing no distinction as to the style of the claim.

The rejection of all of the claims was appealed to us. The Commissioner has not argued otherwise, and both sides briefed and argued all the claims. As stated in the Commissioner's brief, the issue on appeal is whether "The claimed subject matter would have been *prima facie* obvious from the combined teachings of the references." Thus I must dissent from the court's affirmation of the board's rejection of the process claims simply because Dillon did not argue that the process claims are patentable even if the composition claims are not.

B In re Durden

Before this court, Dillon properly did not discuss points that had not been raised by the examiner or the board. Since there had been no reliance on the law of *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), and neither the examiner nor the board cited *Durden*, Dillon did not discuss the law of *Durden*.

The Commissioner, in his answering brief before the Federal Circuit, argued for the first time that *Durden* provided additional authority for upholding the board's rejection of the process claims. The Commissioner stated that if the court decided to reverse the board's holding of unpatentability, the court should consider the effect of *Durden*. The panel, having reversed the board's holding, thus considered *Durden*, as the Commissioner requested; the panel simply observed that *Durden* does not apply to "use" claims.

However, the majority of this court, having affirmed the rejection of all the claims, has no basis for review on additional authority. Thus I can not join the majority's opinion interpreting *Durden*, for it is, in the event, *dictum*.

¹ The process claims were written in the style required by 35 U.S.C. §100(b), see n.15, *supra*. As explained in *In re Moreton*, 288 F.2d 708, 709, 129 USPQ 227, 228 (CCPA 1961), "[t]his mere matter of form [*i.e.*, claiming a new use as a process] should have no effect on patentability."

C The Merits

Applying the guidance of precedent to Dillon's invention: the compositions are new,¹⁴ and their property and use of reducing particulate emissions is not taught or suggested in the prior art. There is no objective teaching in the prior art that would have led one of ordinary skill to make this product in order to solve the problem that was confronting Dillon: to reduce soot from combustion of hydrocarbon fuels. There is no reasonable basis in the prior art for expecting that Dillon's new compositions would have the particulate-reducing property that she discovered. As shown in Part I, *ante*, structure, properties and use must be considered in determining whether a *prima facie* case under section 103 has been made.

The Sweeney references show the water-sequestration property of tri-orthocarbon fuels, and the Elliott reference shows the water-sequestration property of tri- and tetra-orthocarbon fuels (which are not hydrocarbons and not fuels). There is no suggestion in the prior art that would have led one of ordinary skill to make Dillon's new compositions in the expectation that they would reduce particulate emissions from combustion. No reference suggests any relationship between the properties of water-sequestration and soot-reduction. All this is undisputed.

Dillon raises the question of whether the Sweeney and Elliott references "are properly combinable, arguing that they are not in analogous arts. This question need not be decided, for even when combined these references offer no suggestion of the property of reducing particulate emissions from combustion. *In re Nader*, 494 F.2d 1405, 1407, 181 USPQ 639, 641 (CCPA 1974) ("even if one of ordinary skill in the art were moved to combine the references, there would be no recognition that the problem of combustible deposits had been solved").

The board stated that it is inherent in Dillon's compositions that they would reduce particulate emissions, that Dillon "merely recited a newly discovered function inherently possessed" by the prior art. Arguments

¹⁴ If a compound or composition is known, for any use or no use, it is not patentable. 35 U.S.C. §102; *Titanium Metals Corp. v. Banner*, 778 F.2d 773, 780, 227 USPQ 773, 777-78 (Fed. Cir. 1985).

based on "inherent" properties can not stand when there is no supporting teaching in the prior art. Inherency and obviousness are distinct concepts. *In re Sportmann*, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966).

[The inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.]

When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, the PTO must produce supporting references. *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (CCPA 1981).

The applicant's newly discovered properties must be considered in determining whether a *prima facie* case of unpatentability is made, along with all the other evidence. Neither structure nor properties can be ignored; they are essential to consideration of the invention as a whole. But Dillon's own discovery of the soot-reducing property of the tri-orthocarbon fuel composition is not evidence against her in determining whether the prior art makes a case of *prima facie* obviousness. *In re Wertheim*, 541 F.2d 257, 269, 191 USPQ 90, 102 (CCPA 1976) (applicant's own disclosures can not be used to support a rejection of the claims "absent some admission that matter disclosed in the specification is in the prior art"); *In re Ruff*, 256 F.2d at 598, 118 USPQ at 347 ("The mere statement of this proposition reveals its futility").

The board cited *In re Merck*, 800 F.2d at 1097, 231 USPQ at 379, in arguing that obviousness does not require absolute predictability. Obviousness does, however, require a sufficient relationship between the use taught in the reference and the use discovered by the applicant. In *Merck* the reference compound and the claim compound were both known to have psychotropic properties, supporting the holding of *prima facie* obviousness of the claimed specific antidepressant use. Applying this reasoning to Dillon's claims leads to the opposite conclusion, for Dillon's use to reduce soot from combustion is not suggested by the known use of the prior art compositions to scavenge water. Only "use" claims were present in *Merck* — again illustrating that the board, citing *Merck* against Dillon's claim, did not distinguish between composition and use claims in its analysis of Dillon's invention.)

In view of the complete absence of any suggestion in the prior art that Dillon's new compositions would have her newly discovered and unobvious property and use of soot-

reduction, I would reverse the rejection of the composition and the use claims.

The Commissioner raised the policy argument that Dillon is simply removing from the public an obvious variant of Sweeney's and Elliott's compositions, one that might be useful to scavenge water in fuels. In *Ruschig* the court had considered the argument, and remarked that the provision of adequate patent protection for the applicant's new compounds, not previously in existence and having a new and unobvious use, was favored over the "mere possibility that someone might wish to use some of them for some such [other] purpose". 343 F.2d at 979, 145 USPQ at 286. See also, e.g., *Chupp*, 816 F.2d at 647, 2 USPQ2d at 1440, wherein the court expressed a similar view. This practical wisdom has been tested by long experience. It accords with judicial recognition that:

Although there is a vast amount of knowledge about general relationships in the chemical arts, chemistry is still largely empirical, and there is often great difficulty in predicting precisely how a given compound will behave.

In re Carleton, 599 F.2d 1021, 1026, 202 USPQ 165, 170 (CCPA 1979).

Granting Dillon a patent on her invention takes away nothing that the public already has; and the public receives not only the knowledge of Dillon's discovery, for abandoned patent applications are maintained in secrecy, but Dillon is not deprived of an incentive to discover and to commercialize this new product for this new use.¹⁵

Conclusion

Following the weight of precedent, I would hold that a *prima facie* case of obviousness of a new chemical compound or composition requires consideration of not only the chemical structure but also the newly discovered properties, in light of the teachings and suggestions of the prior art. I would expressly reject the Commissioner's position that determination of the *prima facie* case is made regardless of the properties disclosed in the inventor's application.

Since there is no suggestion in the prior art references, alone or in combination, of the particulate-reducing property and use dis-

covered by Dillon for her new compositions, a *prima facie* case of obviousness has not been made. Thus it is not necessary to patentability that Dillon establish that the prior art compositions do not possess the same soot-reduction property and use. I would reverse the board's rejection of claims 2-14, 16-22, and 24-37, all of the claims before us on appeal.

Court of Appeals, Federal Circuit

The Gillette Co. v. S.C. Johnson & Son Inc.

No. 90-1320

Decided November 20, 1990

PATENTS

1. Patentability/Validity — In general (§115.01)

Patent claims are entitled to presumption of validity, and party challenging those claims faces burden of showing invalidity by clear and convincing evidence; such burden is not lessened by party's introduction at trial of prior art not before Patent and Trademark Office during prosecution.

2. Patentability/Validity — In general (§115.01)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Prior adjudication — Res judicata; collateral estoppel (§410.1503)

Earlier decision upholding validity of patent in suit is to be given weight, but not stare decisis effect, in subsequent declaratory judgment action brought by plaintiff who was not party to earlier lawsuit.

PATENTS

3. Patentability/Validity — Obviousness — In general (§115.0901)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Judicial review — Standard of review — Patents (§410.4607.09)

Determination of obviousness is question of law that is freely reviewable on appeal; what is reviewed is federal district court's judgment regarding obviousness, and thus deference is not given to any particular ana-

¹⁵ The majority remarks that Dillon made "no attempt to argue the relative importance" of soot reduction and water sequestration. This dramatic new criterion, although presented in the *amicus* brief of the American Intellectual Property Law Association, should not be approved by this *in banc* court without discussion.

hybridize with the gene so as to provide a further diagnostic test which may determine a genetic predisposition, even in individuals who are not presently synthesizing the polypeptide. Alternatively, a probe can be constructed which recognizes messenger RNA (mRNA) corresponding to the gene and polypeptide. [Emphasis added.]

Having established the amino acid sequence of AAP, a nucleotide probe can be constructed which is complementary to the DNA or mRNA coding for AAP or a portion thereof. Such a probe can then be used as an additional diagnostic test for the disease, or for a predisposition to the disease in individuals who may not express the polypeptide. [Emphasis added.]

See Glenner, column 2, lines 46 through 55, and column 4, lines 30 through 36. In a series of working examples, Glenner discloses the extraction, purification, and amino acid sequencing of AAP. Further, in Example XIII, Glenner provides information and guidelines respecting the synthesis of degenerate oligonucleotide probes, including a ratio "considered acceptable by those skilled in the art." See column 9, lines 61 and 62. The claims of the Glenner patent cover a substantially purified polypeptide isolated from patients with Alzheimer's Disease, AAP, having the amino acid sequence set forth in column 11, lines 3 through 10. The claims also cover a labeled nucleotide probe, comprising a sequence of nucleic acid substantially complementary to the nucleotide sequence coding for the substantially purified polypeptide isolated from patients with Alzheimer's Disease, AAP, having the amino acid sequence set forth in column 12, lines 42 through 49. Finally, claims 20 and 21 are directed to diagnostic assays using the labeled nucleotide probe.

II We believe that the Glenner patent speaks volumes to persons having ordinary skill in the art, and speaks in the chemical language of both nucleic acids and proteins. It would have been obvious to modify Glenner's teachings by using the degenerate oligonucleotide probes of Example XIII to "pull out" or isolate cDNA encoding the brain beta-amyloid polypeptide associated with Alzheimer's Disease from an adult human brain cDNA library.

First, a person having ordinary skill in the art would have been motivated to isolate cDNA coding for AAP. Isolating the cDNA would enable preparation of copious amounts of AAP for research, study, and the advancement of medical science. In this regard, it is well known by those skilled in the art of molecular biology that an isolated

cDNA can be used to generate copious amounts of the protein which it encodes. Glenner discloses the difficulty of obtaining AAP from autopsies of patients suspected of having Alzheimer's disease. Isolating cDNA which codes for AAP would obviate that difficulty and would enable production of increased quantities of purified AAP for numerous desirable purposes. Merely by way of example, see Glenner, col. 1, lines 60-67; col. 2, lines 38-45; col. 2, lines 56-64; and col. 4, lines 19-29.

Second, Glenner puts a person having ordinary skill in possession of the key to success, i.e., two sets of fully degenerate probes. Again, see Example XIII. Appellants have not controverted Glenner's statement in that example that one nucleotide sequence out of each set of degenerate probes will be perfectly complementary to the DNA sequence coding for the AAP protein. Nor do appellants controvert Glenner's statement that such a ratio "is considered acceptable by those skilled in the art." Glenner is not directed to a layman, but rather to a person having ordinary skill in the art versed in the field of molecular biology and the use of recombinant DNA techniques. That hypothetical person is presumed to be familiar with technology and techniques in the field of cloning at the time the invention was made, including (1) rapid advances in the field of cloning discussed in *Adgenes, Inc. v. Chigal Pharmaceuticals Co.*, 13 USPQ2d 1737, 1753-54 (D. Mass. 1989), and (2) more recent techniques of DNA cloning discussed in the 1985 reference relied on by the examiner, note Chapter 2 authored by Hayth entitled "Constructing and Screening cDNA Libraries in *Ag10* and *Ag11*." We agree with the examiner's finding that it would have been obvious to construct and screen an adult human brain cDNA library using the techniques described by Hayth and two sets of fully degenerate probes prepared in the manner described by Glenner, in order to isolate a cDNA clone meeting the limitations of claim 4 on appeal.

Appellants do not controvert that, at the time the invention was made, it would have been well within the skill of the art to sequence the isolated cDNA rapidly and routinely.

For these reasons, we find that a person having ordinary skill would have sufficient basis for the necessary motivation and predictability of success to give sustain a rejection under 35 USC 103. In a nutshell, the combined disclosures of Glenner and Hayth provide a roadmap which would have directed a person having ordinary skill in the art to isolate DNA encoding the brain beta-amy-

loid polypeptide associated with Alzheimer's disease. That roadmap, we believe, would have led inevitably to a clone of DNA meeting the limitations recited in claim 4. On these facts, we hold that the subject matter sought to be patented in claim 4 would have been *prima facie* obvious within the meaning of 35 USC 103 based on the combined disclosures of Glenner and Hayth.

Appellants argue that Glenner's teachings with respect to oligonucleotide probe synthesis "are strictly prophetic," that Glenner nowhere discloses an actual probe or its use in isolating the gene encoding AAP, that Glenner merely sets forth a plan for identifying a gene, and that Glenner "puts an idea on the table and that is all." See appellants' brief before the Board, pages 5 through 7. That line of argument is not persuasive in this case.

If, by that argument, appellants mean to say that Glenner is not an anticipatory reference under 35 USC 102, we agree. Glenner does not disclose constructing an adult human brain cDNA library and screening that library using the degenerate probes described in Example XIII. Nor does Glenner disclose isolating a cDNA clone meeting the limitations of claim 4. The test for obviousness, however, does not require that the claimed invention be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to a person having ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Here, the combined teachings of Glenner and Hayth would have suggested appellants' claimed invention.

If, by that argument, appellants would cast aspersions on the Glenner patent or imply that the patent is non-enabling or otherwise discredit its qualifications as a reference, we disagree. As stated in 35 USC 282, a patent shall be presumed valid and each claim of a patent shall be presumed valid independently of the validity of other claims. Here, the Glenner patent is presumed valid and each claim is likewise presumed valid including claims 18 and 19 drawn to a labeled nucleotide probe and claims 20 and 21 directed to using the probe in a diagnostic assay. Considering that presumption of validity, we presume that Glenner's claims are based on a fully enabling disclosure as required by 35 USC 112. First paragraph. See *In re Lambert*, 545 F.2d 747, 751, 42, 192 USPQ 278, 281 n.2 (CCPA 1976). *In re Jacobs*, 318 F.2d 743, 133 USPQ 888 (CCPA 1963). *In re Mitchell*, 162 F.2d 229, 74 USPQ 107 (CCPA 1947). In view of the statutory presumption

of validity, and the detailed information pertaining to oligonucleotide probe synthesis described in Example XIII, appellants have not shown that (1) Glenner fails to put a person having ordinary skill in the art in possession of two sets of fully degenerate probes capable of hybridizing to a clone of DNA meeting the limitations of claim 4, and (2) the examiner's §103 rejection is based on a non-enabling disclosure. The burden of persuasion falls on appellants to establish that Glenner's disclosure is, in any way, non-enabling and appellants have not met that burden here. Appellants do not and cannot meet that burden by labeling the Glenner disclosure "strictly prophetic." *Cf. In re Shurameterstam*, 673 F.2d 1383, 1384-85, 213 USPQ 441, 442 (CCPA 1982). That the Galilei patent may not have actually reduced to practice a specific mixture has no bearing on whether that mixture is "described in a printed publication" under 35 USC 102(b).

We disagree with appellants' statement in the brief before the Board, page 7, that "Glenner puts an idea on the table and that is all." We would suggest that the following metaphor is more apt under the circumstances: "Glenner puts the key in the lock of the door of success." All that remains for a person having ordinary skill is to turn the key and, in so doing, open the lock. That, in our judgment, does not give rise to a patentable invention.

NO REBUTTAL EVIDENCE

Appellants do not present any argument or arguments before the Board based on affidavits, declarations, or other objective evidence of non-obviousness. Appellants do not rely on evidence which would rebut the statutory presumption that the Glenner patent is valid, or would establish that Glenner's disclosure is non-enabling. Instead, it would appear that appellants incorrectly quote the Glenner patent and misinterpret the evidentiary basis of the rejection. See particularly Glenner, column 2, lines 46 through 48. Additionally with the determination of the amino acid sequence of AAP, it is possible to ascertain the base sequence of the gene coding for AAP. [Emphasis added]. Quoting from that portion of the record, but changing the words, appellants state that it "would be possible to ascertain the base sequence of the gene coding for AAP" (emphasis added).

See appellants' brief before the Board, page 5, footnote 1. We find nothing "prophetic" or "would be" about Glenner's disclosure.

On the contrary, Glenner discloses clearly and unequivocally that it is possible to ascertain the base sequence of the gene coding for AAP. Glenner further discloses the meaning for accomplishing that result, i.e., two sets of fully degenerate probes. Glenner further discloses that these probes find successful application in diagnostic assays where the AAP gene must be distinguished from all other DNA present in the human genome. See col. 10, lines 13-54. A person having ordinary skill in the art would have recognized and understood that those probes may be used successfully to isolate cDNA from a library constructed from mRNA derived from human brain because that library, by definition, contains only those DNA sequences expressed in brain cells. Thus, isolating or "pulling out" a clone which encodes AAP from a suitable cDNA library is less problematical and more likely to succeed than performing a diagnostic assay. Stated another way, Glenner discloses and claims using the probes in diagnostic assays. *A fortiori*, a person having ordinary skill would have reasonably expected that those probes may be used to isolate cDNA.

BELL AND DENEI DISTINGUISHED

According to appellants, the examiner improperly relies on methods described by (Glenner and Hayn) in rejecting the product claims on appeal. (Quoting from *In re Bell*, 991 F.2d 781, 785, 26 USPQ2d 1529, 1532 (Fed. Cir. 1993), appellants state that "the issue is the obviousness of the claimed compositions, not of the method by which they are made".

[2] We are mindful of the holding in *Bell*, and the recently issued opinion *In re Denei*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995), citing *Bell* with approval and reaffirming the principle that a general method of isolating cDNA or DNA molecules is essentially irrelevant to the question whether the specific molecules themselves would have been obvious. In the absence of other prior art that suggests the claimed DNAs. We emphasize, however, that each case under 35 USC 103 is decided on its own particular facts. See *Abdenation Research Corp. v. (Kas, Inc.)*, 793 F.2d 1261, 1268, 229 USPQ 805, 810 (Fed. Cir. 1986). *In re Gohn*, 399 F.2d 246, 158 USPQ 334 (CCPA 1968). Here, unlike the situation presented in *Bell* or *Denei*, "there is something in the prior art to lead to the particular DNA and indicate that it should be prepared". *In re Denei*, 51 F.3d at 1558, 34 USPQ2d at 1215. Here, for reasons already presented at length, the com-

bined disclosures of Glenner and Hayn provide a roadmap which would have directed a person having ordinary skill in the art to a DNA clone meeting the limitations recited in claim 4 on appeal. On these facts, we are persuaded that the prior art provides a sufficient basis for the requisite motivation and predictability of success to sustain a rejection under 35 USC 103.

Glenner discloses the amino acid sequence of AAP and two sets of fully degenerate probes and the successful application of those probes in diagnostic assays. This is a different teaching compared with the Rinderknecht references in *Bell* or the Boilen reference in *Denei* because Glenner, working "back" from protein to gene, begins with the polypeptide AAP and provides ample disclosure leading to the identification of DNA and mRNA which code for that polypeptide. Complications by its absence from Rinderknecht or Boilen is any teaching relating to DNA, cDNA, or the gene coding for the polypeptide of interest. Not only is the "primary" reference Glenner more comprehensive than the primary references in *Bell* or *Denei*, but the "secondary" reference Hayn is also stronger than the secondary references in those cases. Hayn evidences a relatively high level of skill in the art of DNA cloning in 1985, specifically Chapter 2 entitled "Constructing and Screening cDNA Libraries in Agt10 and Agt11". Hayn is more recent and more specific with respect to its relevant disclosure compared with the general method for isolating a gene disclosed by Weissman in *Bell*, or with the general technique for cloning a gene disclosed by Maniatis in *Denei*.

[3] It cannot be gainsaid that methodology plays a role in the examiner's rejection. We find "nothing" intrinsically wrong, however, in the application of methodology in rejecting product claims under 35 USC 103, depending on the particular facts of the case, the manner and context in which methodology applies, and the overall logic of the rejection. Nor do we read *Bell* or *Denei* as issuing a blanket prohibition against the application of methodology in rejecting product claims defining DNA or cDNA. Furthermore, precedent indicates that it is perfectly acceptable to consider the method by which a compound is made in evaluating the obviousness of the compound. See *In re Hart*, 356 F.2d 115, 119, 148 USPQ 548, 551-552 (CCPA 1966) (in determining obviousness, it is appropriate to consider such matters as (1) the manner of preparation of the composition *vis-à-vis* the prior art, (2) the structural similarities as well as differences between the claimed composition and that of the prior

art, and (3) the presence or absence of properties which would be unobvious in view of the prior art). Here, Glenner provides motivation to isolate DNA coding for AAP, enabling preparation of copious amounts of the polypeptide by the standard techniques of recombinant DNA. Glenner discloses the means for accomplishing that result, i.e., two sets of fully degenerate probes, and further discloses that those probes find successful application in diagnostic assays. We believe that these facts are distinguishable from *Bell* or *Denei* and that all arrows point in the direction of obviousness. Glenner constructs a "bridge" of information leading from protein to gene and Glenner, in conjunction with Hayn, provides a roadmap leading to appellants' claimed subject matter.

As stated in *Denei*, 51 F.3d at 1557, 34 USPQ2d at 1214, the issue presented is:

Whether the combination of a "prior" art reference teaching a method of gene cloning, together with a reference disclosing a partial amino acid sequence of a protein, may render DNA and cDNA molecules encoding the protein *prima facie* obvious under §103.

Similarly, as stated in *Bell*, 991 F.2d at 783, 26 USPQ2d at 1531, the issue presented is: "Whether the Board correctly determined that the amino acid sequence of a protein in conjunction with a reference indicating a general method of cloning renders the gene *prima facie* obvious."

The facts before us, however, present a different issue and a more compelling case of obviousness because Glenner discloses more than the amino acid sequence of AAP. Glenner constructs a "bridge" of information leading from the polypeptide AAP via the oligonucleotides corresponding to its amino acid sequence to the gene coding for AAP.

[4] In *Denei*, 51 F.3d at 1559, 34 USPQ2d at 1216, the court emphasizes that "obvious to try" is not the standard under 35 USC 103. As stated in *In re Eli Lilly and Co.*, 902 F.2d 943, 945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990).

An "obvious-to-try" situation exists when a general disclosure may pique the scientist's curiosity such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.

Here, the combined teachings of Glenner and Hayn provide much more than a general disclosure which "may pique the scientist's curiosity". Glenner puts a person having ordinary skill in possession of two sets of

fully degenerate probes, and Hayn discloses specific information pertaining to the construction and screening of a suitable cDNA library. The information in the Glenner patent, when combined with the Hayn reference, provide a reasonable expectation of success which is all that is required for obviousness under 35 USC 103. *In re O'Brien*, 853 F.2d 894, 904, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

For all these reasons, we find that the particular facts before us are distinguishable from those presented in *Bell* or *Denei*. This case, considered in conjunction with *Bell* and *Denei*, provides a good illustration of the axiom that §103 cases are fact-driven and time-specific. Again, each case under 35 USC 103 must be decided on its own particular facts.

OTHER ISSUES

Appellants' invention involves the beta-amyloid protein of Alzheimer's disease. Appellants state at column 1, lines 11-20, of their patent that this protein is shared with adult Down's syndrome citing, *inter alia*, Glenner *et al.*, *Maclean, Hopkins, Kea, Gamm, 122,131* (1984). However, the Glenner publication states at page 1133 that beta-amyloid protein for adult Down's syndrome has an identical sequence to the beta-amyloid protein of Alzheimer's disease "with the exception of a substitution of a Gln for Glu residue at position 11. . . . The retention of Glu" strongly suggests that Glu" is a true substitution and is not due to an artificial denaturation." [emphasis added]. The amino acid sequence in Fig. 1 of this application contains Gln at position 11. Per the Glenner publication, the amino acid sequence of Fig. 1 is for the beta-amyloid protein of adult Down's syndrome and Alzheimer's disease as stated by appellants.

Also, it does not appear that the clone of DNA defined in claims 4 through 10, 12 and 13, newly added during this reissue proceeding, finds express or implicit support in the original specification of U.S. Patent No. 4,312,206, especially that portion of the claims that requires the clone of DNA to hybridize with messages for beta-amyloid polypeptide of Alzheimer's disease.

Appellants and the examiner should address and clarify these matters if prosecution on this subject matter is resumed in another reissue application. In view of our disposition of this case, however, we refrain from entering new grounds of rejection under the provisions of 37 CFR § 1.196(b).

CONCLUSION

We hold that this case is distinguishable from *Hell* or *Daniel*, and that the subject matter sought to be patented in claim 4 would have been obvious based on the combined disclosures of Glenner and Hynyn. As previously indicated, all claims on appeal stand or fall together with claim 4. Accordingly, we sustain the rejection of claims 2 through 13 under 35 USC 103 as unpatentable over the combined disclosures of Glenner and Hynyn.

The examiner's decision, refusing to allow claims 2 through 13, is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

APPROVED.

W.F. Smith, administrative patent judge, concurring.

Application 07/858,959

I agree with the majority's conclusion that the subject matter sought to be patented in this reissue application would have been obvious to a person having ordinary skill in the art at the time the invention was made. I also agree with the majority's reasoning and join its affirmation of the pending rejection under 35 U.S.C. § 103 based upon the combined disclosures of Glenner and Hynyn. I write separately to present my views regarding applicant's argument that the decisions in *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529 (Fed. Cir. 1993) and *In re Daniel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995) establish a *per se* rule in deciding the patentability of the nucleotide sequences claimed in this application.

The main argument presented by applicants in this appeal is that the examiner's rejection is in error *solely* because the present product claims are rejected on the basis of prior art methods. As seen from the dissent, *Hell* and *Daniel* can be read as supporting such a *per se* rule. However, in my view, reading these cases as setting forth a *per se* rule controlling on the facts in evidence in this record is in error.

Any obviousness determination made under 35 U.S.C. § 103 must begin with the premise that each case must be decided on the facts in evidence in that case. As stated in *In re Darden*, 763 F.2d 1406, 1410, 226 USPQ 359, 361 (Fed. Cir. 1985): "What we or our predecessors may have said in discuss-

* Reissue application filed March 27, 1992; which is seeking to reissue U.S. Patent No. 4,912,206, issued March 27, 1990.

ing different fact situations is not to be taken as having universal application." Rather than attempting to extract a mechanical rule from fact driven decisions such as *Hell* and *Daniel*, the decision maker should premise the ultimate conclusion of obviousness in a case involving nucleotide sequences, as in any other case, on the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966): (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the relevant art; and (4) objective evidence of nonobviousness, if present.

A review of the analogous factual situation presented in *In re Kratz*, 592 F.2d 1169, 201 USPQ 71 (CCPA 1979), is here instructive. *Kratz* involved the obviousness of a compound which could be isolated and identified using well established prior art methods. In reversing the decision of the board, the court held that it was error to make weight of the method applicant used in finding the compound because 35 U.S.C. § 103 explicitly states that "[p]atentability shall not be negated by the manner in which the invention was made." 592 F.2d at 1175, 201 USPQ at 76. Rather, the court indicated that patentability should be based on a comparison of the claimed compound and the "prior art." The court pointed out that *the prior art must provide some basis for selecting that compound* and stated that the decision maker must distinguish between "substituting skill in the art for statutory prior art" and using that skill to interpret prior art. *Id.*

The court also considered the prescription of 35 U.S.C. § 103 regarding the manner in which an invention is made in *Merck & Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 809, 10 USPQ2d 1843, 1847 (Fed. Cir. 1989) stating that the "converse is equally true: patentability is not impaired where the prior art would have suggested that this process should be carried out and would have a reasonable likelihood of success viewed in light of the prior art." *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988).

In applying the statute to the facts in this case to determine the obviousness of the claimed nucleotide sequences, it appears that the proper context for taking into account the methodology used in the prior art to identify and isolate nucleotide sequences coding for valuable proteins is in the determination of the level of skill in this art. As set forth in *Custom Accessories v. Jeffrey-Allen Industries*, 807 F.2d 955, 962-63, 1 USPQ2d 1196, 1201 (Fed. Cir. 1986), the determina-

tion of the level of skill of the hypothetical person is primarily based upon real world factors such as "type of problems encountered in art, prior art solutions to these problems, rapidly with which innovations are made; sophistication of technology; and education level of active workers in the field." Clearly, as applied to this art, the first two stated factors involve the manner in which workers in this field identify and isolate nucleotide sequences when they have knowledge of a partial or complete amino acid sequence of a valuable protein. Thus, the decision maker must determine the level of ordinary skill in this art from an understanding of how the prior art goes about solving the workaday problem of identifying and isolating nucleotide sequences and then take that level of skill into account when making the legal conclusion of obviousness. 35 U.S.C. § 103, *Graham v. John Deere*, *supra*.

The determination of the level of skill in a given art in *ex parte* patent cases in the PTO is usually based upon the prior art references made of record in that proceeding. As recited in *In re Givac*, ___ F.3d ___, 35 USPQ2d 1116 (Fed. Cir. 1995), "this approach... offers valuable insight in considering the Custom Accessories factors." Here, real world workers in this field who isolate proteins are clearly "motivated" to determine the nucleotide sequences that code for such proteins so that increased quantities of the protein may be produced through recombinant DNA technology. These real world workers sequence newly isolated proteins and, based upon the determined amino acid sequence, construct a high-molecular weight oligonucleotide probes to screen an appropriate cDNA library. Applying this general method to a specific protein may be more or less difficult depending on the circumstances of that work, e.g., number of unique codons, whether the gene of interest is one in a family of related genes, etc. The desired nucleotide sequence coding for a given protein may be identified and isolated

from a cDNA library using only ordinary skill in the art, or in some situations, may require using a greater level of skill. That determination must be made on the facts in given case and not on the basis of *per se* rule. Other cases or on the basis of a *per se* rule.

Using this level of skill in the art to interpret the prior art applied against claim 4, *In re Kratz*, 592 F.2d at 1175, 201 USPQ at 76, it can be seen that Glenner and Hynyn do provide a basis for selecting a nucleotide sequence within the scope of claim 4, or as stated in *Daniel*, 51 F.3d at 1558-59, 34 USPQ2d at 1215, there is "something in the prior art to lead to the particular DNA and prior art to lead to the particular DNA and indicate that it should be prepared." Specifically, as developed by the majority, Glenner provides a description of a valuable protein and its amino acid sequence. Knowledge of the amino acid sequence allowed Glenner to describe two scientifically and logically sound families of probes. While each family of probes contains 128 members, one member of each family will be perfectly complementary to the DNA sequence coding for the protein. Glenner states at column 9, lines 61-62 that "[s]uch a ratio is considered acceptable by those skilled in the art." Hynyn provides textbook details as to how one uses probes such as those described by Glenner to identify and isolate a cDNA sequence of interest from a cDNA library.

In addition, Hynyn outlines the standard procedure to be used at page 49 as follows:

A cDNA library representing the mRNA population is constructed using the polyadenylated RNA extracted from the appropriate tissue or cell type. The cDNA of interest is then identified within the population of cDNA clones by screening the library with synthetic oligonucleotide probes. cDNA probes representing differentially expressed mRNAs, or an antibody probe. The frequency at which cDNA clones of a particular mRNA species appear in a cDNA library is generally proportional to the abundance of that species in the mRNA population. To isolate cDNA clones of rare mRNAs, it is necessary to be able to construct very large

* The circumstances of *Givac* point out how fact-specific obviousness determinations are and, thus, the danger in trying to extract general or *per se* rules from reported cases. There, in a first reexamination proceeding this board reversed a rejection under 35 U.S.C. § 103 based solely on an *abstract* reference. In a second, subsequent reexamination proceeding, this board affirmed a rejection under 35 U.S.C. § 103 based upon the same *abstract* reference and twelve newly relied upon references, which decision was subsequently affirmed by the court, i.e., different facts — different decision.

* Claim 4, due to the functional language, is inclusive of a large number of DNA sequences. Applicants have not disputed the underlying basis of the examiner's rejection that using the teachings of Glenner and Hynyn in the indicated manner will necessarily result in the identification and isolation of a DNA sequence within the scope of claim 4. Rather, applicants' argument is a legal one that it is *per se* error for the examiner to rely upon methodology in rejecting the nucleotide sequences of claim 4.

cDNA libraries representative of complex poly(A)⁺ RNA populations. This chapter presents a simple, detailed procedure for preparing cDNA libraries containing of the order of 10^3 to 10^5 recombinants. Double-stranded cDNAs prepared by this procedure are ligated into one of two vectors. The use of a λ vector instead of a plasmid vector makes it possible to take advantage of the high efficiency and reproducibility of *in vitro* packaging of λ DNA as a method of introducing DNA sequences into *E. coli*. The high efficiency of cloning cDNAs into λ vectors is useful when cDNA clones of rare mRNAs are sought or when mRNA for preparing is limited in quantity.

Hoyth then describes two λ vectors suitable for cloning cDNAs—Ag110 and Ag111. A library based upon either vector can be screened using an appropriate family of oligonucleotide probes (pages 72-73), although it is preferred to screen libraries in Ag111 with antibody probes (pages 73-75).

Appellants submit at column 3, lines 11-13 of the specification of their patent for which reissue is sought that an adult human brain Ag111 cDNA library can be purchased from a commercial source.¹ Since the polypeptide of Glomer is expressed in brain tissue, expected the cDNA corresponding to the message for this protein to be in the commercial library. As taught by Hoyth, Ag111 vector-based cDNA libraries are useful in identifying and isolating cDNA clones of even rare mRNAs. The "motivation" to identify and isolate a nucleotide sequence

¹This fact was not relied upon by the examiner in rejecting the pending claims. Rather, the examiner's position is premised upon the ability of one of ordinary skill in the art to construct an appropriate cDNA library based upon the commercial disclosures of Glomer and Hoyth, i.e., the hypothetical person of ordinary skill would construct a cDNA library when the text would clearly possessed such a library. I, like the majority, find no error in the examiner's determination of this matter and appellants do not challenge this determination. Why this fact was not relied upon by the examiner and its significance discussed on the record is not apparent. For example, Glomer states at column 7, lines 24-25, that he formed. Such antibodies would be expected to be useful in screening the commercial Ag111 adult human brain library since Hoyth teaches that it is preferred to screen such libraries using antibody probes. Thus, the level of skill in this art is such that the hypothetical person of ordinary skill would have had, not one, but two methods of probing the commercial Ag111 library to identify and isolate the nucleotide sequence of interest.

coding for the valuable protein of Glomer from an appropriate cDNA library is self-evident and has not been denied or controverted by appellants in any manner.

Viewing these prior art facts in light of the level of skill of the ordinary worker in this art, it can be seen that this prior art does provide an objective basis to conclude that the hypothetical ordinary person of skill in this art would have found it obvious to identify and isolate a nucleotide sequence within the scope of claim 4. These facts form a basis to reach the conclusion that it would have been reasonable to expect that the nucleotide sequence of interest was in the commercial human brain Ag111 cDNA library and that one of ordinary skill in this art would have been able to identify and isolate that sequence using either the oligonucleotide probes or the antibody probes described by Glomer.

This is not to create a *per se* rule the other way, that the obtaining of a nucleotide sequence would always be obvious given the amino acid sequence of a protein. It must be kept in mind that this conclusion is only a legal fiction, a so-called *prima facie* case of obviousness. Legal fictions must under appropriate circumstances give way to real world facts. *Purdum Corp. v. Deaconson Manufacturing Co.*, 774 F.2d 1082, 1095, 227 USPQ2d 337, 345 (Fed. Cir. 1985) (error not to credit the real world environment surrounding the inventions" disclosed by applicant and the prior art patents). As stated in *In re O'Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988), "[f]or many inventions that seem quite obvious, there is no absolute predictability of success until the invention is reduced to practice. There is always the possibility of unexpected results, that would then provide an objective basis for showing that the invention, although apparently obvious, was in fact nonobvious. [citations omitted]". Here, appellants have not relied upon any objective evidence of nonobviousness which would establish that the obtaining of nucleotide sequences within claim 4 on appeal would have required the use of a level of skill beyond the level of ordinary skill in this art.

In summary, rather than try to extract mechanical or *per se* rules from precedential decisions of our reviewing court or this board, one's efforts would be better spent in making the *Graham* fact findings including determining the level of skill in the art taking into account the *Chakrabarty* factors. These cases present very difficult technical and legal issues and are not amenable to pigeonhole style disposition. It is only by way of very thorough fact finding by the exami-

er in the first instance, with the aid of applicable, that obviousness determinations can be made at any decisional level with any degree of facility and confidence since a conclusion of obviousness or nonobviousness is only as strong as its factual underpinnings. Based upon the facts in this case, I find no error in the examiner's determination that the subject matter of claim 4 would have been obvious to one of ordinary skill in the art at the time of this invention.

Grom, administrative patent judge, dissenting.

Application 07/07/858,959.¹

I am led by *In re Deuel*, 51 F.2d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995) to conclude that the merits panel's decision to affirm the examiner's rejection under 35 U.S.C. § 103 in this case, based on the comparative records, is inconsistent with the court's direction. Therefore, I am obliged to dissent.

As was the case in *Deuel*, the claims here are drawn to DNA which encodes a polypeptide responsible for the biological activity of a protein, i.e., the applicants in *Deuel* claimed DNA encoding a heparin-binding growth factor while the present applicants claim DNA encoding a beta-amyloid polypeptide of Alzheimer's disease. In each case, prior art cited, most especially a reference describing the protein itself, would have motivated a person having ordinary skill in the art to identify and isolate the DNA which encodes production of the protein so to produce increased quantities of the valuable protein via recombinant DNA technology.

The prior art of record in *Deuel* described a unique portion of the amino acid sequence of a valuable protein and provided enough information about the protein along with conventional procedures for analyzing the protein to enable any person skilled in the art to determine the complete amino acid sequence of the protein without undue experimentation. Thus, the prior art cited in each case placed the amino acid sequence of the active polypeptide of a valuable protein in the hands of the public. In each case, general methodologies for (1) identifying target DNA using probes which correspond to the fragment of active polypeptide which has the least possible number of codons, and (2) isolating target DNA so identified, were either described in the cited prior art or known in the art. Thus, in each case, persons having

ordinary skill in the art had what the majority of the Board here refers to as a "road map" for, or the "key" to, success in identifying and isolating the target DNA sequence. The case presented to the court in *Deuel* included the Board's findings that:

(1) the prior art generally described conventional techniques for identifying and isolating target DNA which encodes a protein from a cDNA library using a reasonable number of DNA probes all of which correspond to an amino acid sequence of a select fragment of the protein; (2) persons having ordinary skill in the art reasonably would have expected to be able to identify and isolate target DNA which encodes a protein from an appropriate cDNA library using the prior art techniques, without undue experimentation; and

(3) persons having ordinary skill in the art would have been motivated by the prior art teaching to identify and isolate the DNA which encodes the protein for use in producing larger quantities of the protein via recombinant DNA technology. Nowhere in the *Deuel* decision does the court hold that the Board's findings were clearly erroneous. In *Deuel*, the Board specifically cited and expressly accepted established views of the state of the art. The Board quoted Watson et al., from *Recombinant DNA—A Short Course*, Scientific American Books, page 78 (1983):

[f]or a specific cDNA probe, at worst, only a few weeks may be necessary to screen a plings library for the respective genes. . . . [3]

and, from Watson, *Molecular Biology of the Gene*, Benjamin/Cummings Publishing Co., page 611 (4th ed. 1987) (emphasis added):

If . . . the proteins of interest have been characterized by *partial* or *full amino acid sequencing*, then . . . intelligent guesses can be made as to its corresponding mRNA (DNA) sequence. Because all amino acids but one are specified by more than one codon . . . it is not possible to go from an amino acid sequence to a DNA sequence unambiguously. By focusing on sequences that *uniquely* contain the less common amino acids, it is *usually* possible to define a small collection of oligonucleotides, one of which should be exactly complementary to the segment of interest. . . . Such a restricted collection can then be used as probes to identify the complementary cDNA clones by hybridization. Do the facts in this case differ from the facts in *Deuel*? They certainly do. However, different facts in different cases are often comparable when cases present similar is-

¹ Reissue application filed March 27, 1992, seeking to reissue U.S. Patent 4,912,206, issued March 27, 1990.

sues of law. Facts in different cases normally are different. Nevertheless, an earlier decision based on different facts may very well provide valuable legal precedent in deciding a new case with new facts (analogous omitted). The better question is whether the record in this case is so different from the record in *Denel* that the examiner's rejection of the appended claims to DNA in this case should be sustained? I think not.

First, I agree with the majority that although the foreign patent publication cited in *Denel* (Bohlen) described an active protein which, perforce, must be encoded by DNA and a unique 19 amino acid N-terminal sequence of that protein, Bohlen (1) did not expressly refer to the DNA which encodes the protein, (2) did not literally express a need or want to identify and isolate the DNA which encodes the protein, and (3) did not point to any specific method known for identifying and isolating DNA which encodes a protein or assess the potential for success in identifying and isolating the DNA which encodes heparin-binding growth factor for using the methods known in the art. Nevertheless, under 35 U.S.C. § 103 a reference must be considered not only for what it expressly teaches, but also for what it would have fairly suggested to persons having ordinary skill in the art. *In re Burkkel*, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979).

In *Denel*, the "real world" applicants there (a) defined the DNA they claimed by reference to the complete amino acid sequence of the protein it encodes; (b) defined the protein also claimed by reference to either (i) the amino acid sequence of a unique N-terminal fragment of the protein and its properties or (ii) the complete amino acid sequence of the protein; and (c) traversed the restriction the examiner required between claims drawn to DNA and claims directed to the protein it encodes by arguing that DNA sequences and the proteins they encode are so inextricably related to each other that a search for a DNA sequence would logically include searching for polypeptide sequences. In short, the Board in *Denel* found that, when provided with either the complete amino acid sequence of a protein or a unique fragment of the isolated and purified protein, any "real world" person having ordinary skill in the art would have considered the DNA which encodes the protein, would have understood that the DNA which encodes the protein can be employed to produce the protein in large quantities using known recombinant DNA techniques, and accordingly it would have been motivated to identify and

isolate the DNA which encodes a valuable protein by methods known in the art.

Second, the majority makes much ado of the fact in this case that the same reference which describes the amino acid sequence of the active polypeptide also mentions the DNA which encodes the polypeptide and teaches that a reasonable number of probes, all corresponding to a fragment of the polypeptide having the lowest number of degenerate codons, can be designed, constructed, and employed to identify and isolate the target DNA by conventional methods with a reasonable expectation of success. However, since the rejection in this case is for obviousness under 35 U.S.C. § 103, I do not see that claimed DNA is any more or less obvious depending on the number of prior art references which supply the requisite teaching. Obviousness under 35 U.S.C. § 103 does not require in express suggestion of the claimed invention in any one or all of the references. The test for obviousness under 35 U.S.C. § 103 is what the combined teachings would have suggested to persons having ordinary skill in the art. *In re Keller*, 642 F.2d 413, 423, 208 USPQ 871, 881 (Fed. Cir. 1981). *Advanced Inze Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (emphasis added; citations omitted).

The criterion ... is not the number of references, but what they would have meant to a person of ordinary skill in the field of the invention.

... [T]he test is whether the teaching of the prior art, taken as a whole, would have made obvious the claimed invention.

Third, although Glenner states that "the polypeptide can be used to produce a nucleotide probe which can be hybridized with the gene which codes for this or a homologous polypeptide" (col. 1, line 68, to col. 2, line 2), Glenner's teaching is no more instructive for or expectation of success than Watson's statements in the textbooks from which the Board in *Denel* quoted. Compare the following statement by Glenner (col. 2, lines 46-50, emphasis added):

[W]ith the determination of the amino acid sequence of AAP, it is possible to ascertain the base sequence of the gene encoding for AAP. A nucleotide probe can be constructed which will recognize and hybridize with the gene. ... to the 1987 statement by Watson, *ibid.*, quoted by the Board:

If ... the proteins of interest have been characterized by partial or full amino acid sequencing, then, ... it is usually possible to define a small collection of oligonucleo-

tide, one of which should be exactly complementary to the segment of interest. ... The select amino acid segments of the AAP polypeptide described by Glenner, the corresponding genetic codes of which are sufficiently low in number to generate two sets of 128 different nucleotide probes, are no more specific and no more unique than the N-terminal 19 amino acid segment of the heparin-binding growth factor described by the Bohlen reference applied in *Denel*. Both Glenner and Bohlen describe polypeptide segments of proteins from which persons having ordinary skill in the art not only readily could have designed two sets of 128 DNA probes (see *Angen Inc. v. Chigot Pharmaceutical Co.*, 927 F.2d 1200, 1207-1208 n.4, 18 USPQ2d 1016, 1022 n.4 (Fed. Cir.), *cert. denied*, 112 S.Ct. 169 (1991)) but, as the Mannan reference in *Denel* suggested, likely would have designed two sets of 128 DNA probes for use in combination with even greater expectation of success. In fact, the likelihood of the person having ordinary skill in the art of successfully identifying and isolating the DNA which encodes heparin-binding growth factor with one or a combination of probes based on Bohlen's protein fragment would have been far greater than would have been the case with one or a combination of probes designed from Glenner's polypeptide segment. Glenner states (col. 9, lines 59-67):

One out of the 128 will be perfectly complementary to the DNA sequence coding for the AAP protein. Such a ratio is considered acceptable by those skilled in the art.

To select for the correct coding combination, the hybridization of the probe to the genome conditions can be adjusted to a point where only the perfectly complementary probe will be stably hybridized to the genome DNA.

The majority finds that persons having ordinary skill in the art would have been likely to succeed in hybridizing Glenner's probes to the target DNA. I agree. However, the likelihood that the skilled artisan would have successfully hybridized probes designed from Bohlen's fragment appears to have been even greater. Unlike Bohlen's description in *Denel*, Glenner does not teach that the polypeptide segments to which his sets of 128 probes correspond are *unique* to the active polypeptide he describes. Thus, persons having ordinary skill in the art with Glenner's teaching before them reasonably could expect, contrary to the combined prior art teaching in *Denel*, that other probes in Glenner's sets of 128 probes would hybridize to some other DNA present in a human genome which includes DNA encoding a

most of different polypeptides. To the contrary, only one of 128 probes most likely to have been designed based on Bohlen's unique amino acid sequence reasonably could have been expected to hybridize with genomic DNA. The DNA to which that probe hybridized most likely would be the DNA which encoded heparin-binding growth factor. Although only specific probes from Glenner's sets of 128 could be made to stably hybridize to target DNA, other probes in the sets designed from Glenner's amino acid segments could just as likely stably hybridize to other DNA in the human genome. In short, if a person having ordinary skill in the art reasonably could not have expected to identify and isolate target DNA from a cDNA library using a known method in view of Bohlen's description of a unique N-terminal amino acid fragment of heparin-binding growth factor, the same artisan likely would not have expected to be able to identify and isolate target DNA from genomic DNA by the same methodology in view of Glenner's description of amino acid sequences of the polypeptide of interest to him. If *Denel*'s claims are patentable over the prior art cited in that case, it is my view that applicants' claimed DNA must be patentable over the prior art cited in this case.

Fourth, the majority emphasizes the fact that Glenner is a United States patent which presents claims to a labeled nucleotide probe complementary to and hybridizing with DNA which encodes the AAP polypeptide. Claims in a United States patent carry a presumption of validity as a matter of law (35 U.S.C. § 282), i.e., the specification of Glenner's patent presumptively would have enabled any person skilled in the art to identify, isolate and use the labeled complementary probe it claims at the time the patent application was filed. Thus, the majority reasons that Glenner presumptively placed a DNA probe complementary to the target DNA applicants claim in the possession of the public. Therefore, the majority reasons, the DNA applicants claim would have been obvious to any person having ordinary skill in the art within the meaning of 35 U.S.C. § 103.

The legal presumption that a description in a prior patent satisfies the enablement requirements of 35 U.S.C. § 112, first paragraph, is not controlling in this case. Certainly, what the PTO allowed in previous cases is not binding in cases presented with different facts and new evidence at another time. *In re Willes*, 435 F.2d 1060, 1062-1063, 172 USPQ 667, 669 (CCPA 1972). Furthermore, obviousness determinations are generally based on "real world" evidence, not

presumptions. *Pundit Corp. v. Dennison Manufacturing Co.*, 774 F.2d 1082, 227 USPQ 347 (Fed. Cir. 1985) and *In re Proter*, 415 F.2d 1478, 159 USPQ 583 (CCPA, 1968). Absent a more specific description of the precise nucleotide sequence of the protein claimed in Glenner's patent which is complementary to the target DNA, the structure of the target DNA would have been no more obvious to persons having ordinary skill in the art than would have been the case in view of the information either Glenner or Roblen provides about the amino acid sequences of the protein the target DNA encodes. Thus, the legal presumption should carry no evidentiary weight in this case.

Nevertheless, I generally agree with many of the majority's findings and arguments and even its conclusion that the subject matter claimed would have been obvious to a "real world" person having ordinary skill in the art. However, I am obliged to conclude that the claims on appeal are patentable under 35 U.S.C. § 103 over the prior art cited in this case, as a matter of law.

In my view, the majority misinterprets the legal direction our reviewing court provides in *In re Denel*, *supra*, i.e., the criterion or standards the Patent and Trademark Office (PTO) is thereafter to apply in determining the patentability of claims drawn to DNA which encodes an active polypeptide or protein under 35 U.S.C. § 103. The majority's conclusion that appellants' claimed DNA would have been obvious at the time their invention was made to any person having ordinary skill in the art in view of the state of the art at that time appears, based on "real world" evidence, to be correct. The problem with the majority's conclusion is that they have erroneously looked to "real world" evidence of patentability under 35 U.S.C. § 103. In the "real world" to which our reviewing court has time and again referred (for example, see *Pundit Corp. v. Dennison Manufacturing Co.*, *supra*, and *In re Proter*, *supra*) knowledge of an unique amino acid sequence of a fragment of a protein, the certain degeneracy of which suggests a reasonable number of DNA probes, and conventional methodology which would have enabled any person skilled in the art to identify and isolate target DNA, reasonably would have placed the DNA sequence which encodes the protein within the public's grasp, i.e., would have reasonably placed the target DNA in the possession of the public. Kerstein, Glenner's and Watson's statements. Thus, the majority's opinion merely reflects the knowledge in and state of the art as it would have existed in the "real world" at the time appellants' invention was made. However,

the court in *Denel* directs the PTO to disregard all "real world" reasonable expectations that persons having ordinary skill in the art would have had of successfully identifying and isolating the DNA which encodes a protein, because the standards for obviousness generally applied, even in the biochemical arts (see *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988)), simply are not applicable to determinations of the patentability of claims drawn to DNA which encodes a protein under 35 U.S.C. § 103.

In my view, the court in *Denel* instructed the PTO that claimed DNA which encodes a protein is not *prima facie* obvious within the meaning of 35 U.S.C. § 103 over prior art teaching unless:

(1) the prior art describes the identical or substantially identical nucleotide sequence of the DNA claimed;

(2) the prior art describes so much of the nucleotide sequence of the claimed DNA that persons having ordinary skill in the art reasonably could have envisioned the sequence and would have been both motivated and enabled to isolate it without undue experimentation; or

(3) the prior art teaches the complete amino acid sequence of the polypeptide or protein and a technique for identifying and isolating DNA which encodes it and the claims are drawn broadly to all DNA likely to encode the protein of interest.

Here, as in *Denel*, none of the above three cases is presented. Consequently, the claims on appeal must be patentable under 35 U.S.C. § 103 over the applied prior art. The majority sees "real world" obviousness. So do I. However, the decision of the court in *Denel* tells me that evidence of and the standards for "real world" obviousness no longer have a place in determining the patentability of claims drawn to DNA encoding proteins under 35 U.S.C. § 103, regardless of their applicability in other fields of invention.

The opinion of the court in *In re Denel*, 51 F.3d at 1558-1560, 34 USPQ2d at 1215-1216, reads:

[T]he precise cDNA molecules of claims 5 and 7 would not have been obvious over the Roblen reference because Roblen related cDNA molecules, not the defined or closely related cDNA molecules. The redundancy of the genetic code precluded contemplation of the specific cDNA molecules of claims 5 and 7. . . . What cannot be contemplated or conceived cannot be obvious.

The genetic code relationship between proteins and nucleic acids does not over-

come the deficiencies of the cited references.

No particular one of these DNAs can be obvious unless there is something in the prior art to lead to the particular DNA and indicate that it should be prepared.

A different result might pertain, however, if there were prior art, e.g., a protein of sufficiently small size and simplicity, so that lacking redundancy, each possible DNA would be obvious over the protein. See *In re Penner*, 301 F.2d 676 (133 USPQ 275) (CCPA 1962).

The PTO's focus on known methods for potentially isolating the claimed DNA molecules is also misplaced because the claims at issue define components, not methods. See *In re Bell*, 991 F.2d 781, 785, 26 USPQ2d 1529, 1532 (Fed. Cir. 1993).

[T]he existence of a general method of isolating cDNA or DNA molecules is essentially irrelevant to the question whether the specific molecules themselves would have been obvious, in the absence of other prior art that suggests the claimed DNAs.

There must . . . still be prior art that suggests the claimed compound in order for a *prima facie* case of obviousness to be made out.

The fact that one can conceive a general process in advance for preparing an *undefined* compound does not mean that a claimed *specific* compound was precisely envisioned and therefore obvious. Thus, a conceived method of preparing some undefined DNA does not define it with the precision necessary to render it obvious over the protein it encodes.⁷

⁷To "envision" a DNA sequence or its chemical structure, the mind of the person having ordinary skill in the art must form a definite and permanent idea of the complete and operative invention. See *Brown v. Berdner*, 5 F.3d 1193, 30 USPQ2d 1862, 1865 (Fed. Cir. 1993). *Hydrex Inc. v. Alton Development, Inc.*, 802 F.2d 1367, 1376, 231 USPQ 81, 87 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Coleman v. Dines*, 754 F.2d 353, 359, 224 USPQ 857, 862 (Fed. Cir. 1985). Notwithstanding that definition, the court in *O'Farrell*, 853 F.2d at 903, 7 USPQ2d at 1681, said:

Obviousness does not require absolute predictability. . . . Indeed, for many inventions that seem quite obvious, there is no absolute predic-

We conclude that, because the applied references do not teach or suggest the claimed cDNA molecules, the final rejection of claims 5 and 7 must be reversed.

Written in . . . result-oriented form, claims 4 and 6 are thus tantamount to the general idea of all genes encoding the protein, all solutions to the problem. Such an idea might have been obvious from the *complete* amino acid sequence of the protein, coupled with knowledge of the genetic code, because this information may have enabled a person of ordinary skill in the art to envision the idea of, and, . . . even identify all members of the claimed genus.

Unlike the majority, I need no further clarification or elaboration of the *Bell* and *Denel* decisions to understand the path the court in *Denel* explicitly directs the PTO to take in cases with similar facts and issues. Therefore, I must dissent from the Board's decision in this case. The examiner's rejection of Claims 2-13 under 35 U.S.C. § 103 over the combined teachings of Glenner and Hought should be reversed in this case as a matter of law, even though I completely agree with the majority that the subject matter appellants here seek to patent would have been obvious to a person having ordinary skill in the art in the "real world" of biotechnology, as a matter of fact.

U.S. Court of Appeals Federal Circuit

Polymer Technologies Inc. v. Bridwell

No. 96-1182

Decided December 23, 1996

REMARKS

1. Non-monetary and injunctive — Equitable relief — Preliminary injunctions — In general (§505.6/07.01)

Before granting preliminary injunction, federal district court must consider likelihood of success on merits, irreparable harm, balance of hardships, and impact of injunction on public interests, but more limited analysis may support trial court's denial of preliminary injunction; court therefore need

not show that the invention is reduced to practice.